

Dell Latitude 5401

Technical Guidebook



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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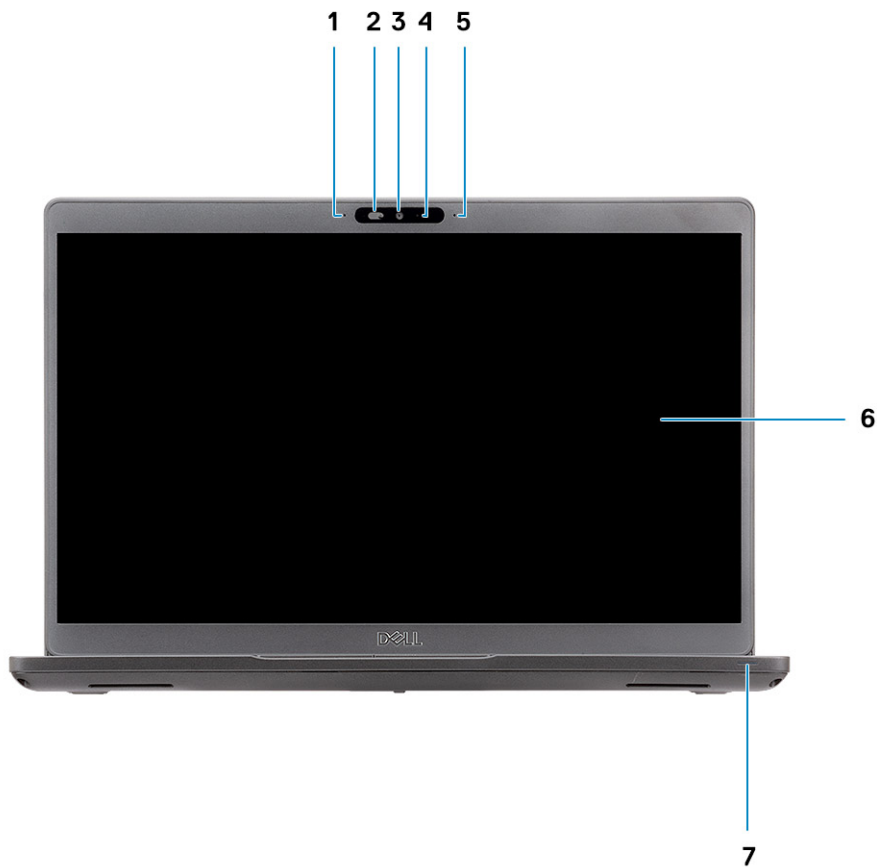
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Chassis overview

Topics:

- Display view
- Left view
- Right view
- Palmrest view
- Bottom view

Display view



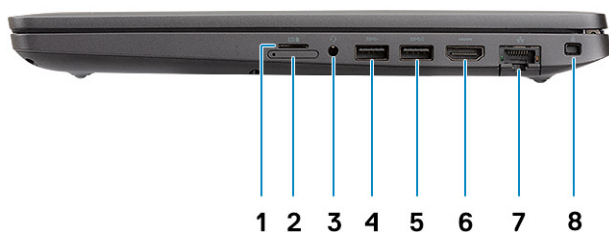
1. Array microphone
2. Camera shutter
3. Camera
4. Camera status light
5. Array microphone
6. LCD panel
7. LED activity light

Left view



1. Power connector port
2. USB 3.1 Gen 2(USB Type-C) port with Thunderbolt
3. USB 3.1 Gen 1 port
4. Smart card reader (optional)

Right view



1. microSD card reader
2. micro-SIM card slot (optional)
3. Headset/ Microphone port
4. USB 3.1 Gen 1 port
5. USB 3.1 Gen 1 port with PowerShare
6. HDMI port
7. Network port
8. Wedge-shaped lock slot

Palmrest view

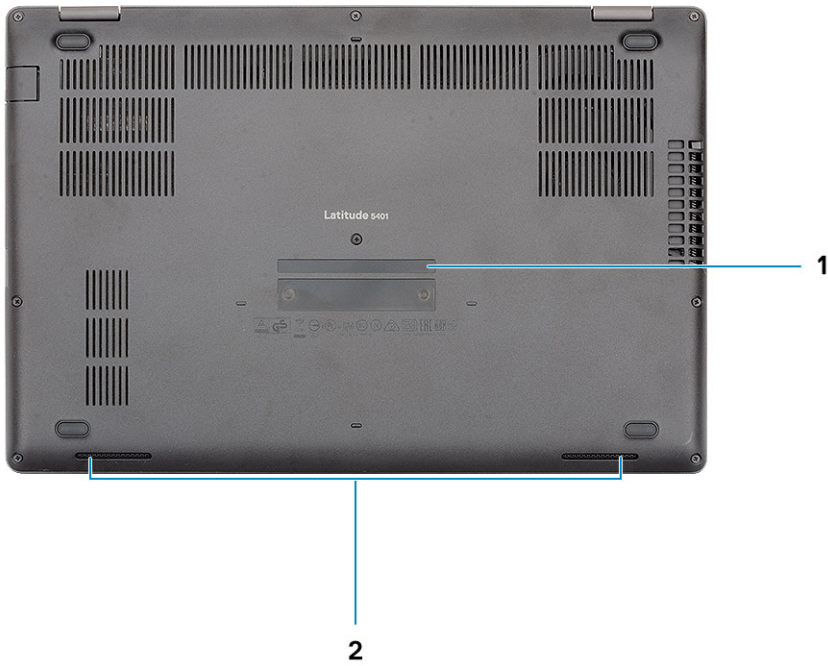


1. Power button with optional fingerprint
2. Keyboard
3. Contactless smart card reader (optional)
4. Touchpad



1. Power button with optional fingerprint
2. Keyboard
3. Touchpad

Bottom view



1. Service tag label
2. Speakers

Technical specifications

Chipset

Table 1. Chipset

Description	Values
Chipset	CM246
Processor	9th Generation Intel Core i5/i7
DRAM bus width	Dual 64 bit
Flash EPROM	24/32 MB(32 MB for Vpro SKU)
PCIe bus	PCIe 3.0

Processors

Table 2. Processors

Description	Values		
Processors	9th Generation Intel Core i5-9300H	9th Generation Intel Core i5-9400H	9th Generation Intel Core i7-9850H
Wattage	35 W	35 W	35 W
Core count	4	4	6
Thread count	8	8	12
Speed	4.1 GHz	4.3 GHz	4.6 GHz
Cache	8M	8M	12M
Integrated graphics	Intel UHD Graphics 630	Intel UHD Graphics 630	Intel UHD Graphics 630

Memory

Table 3. Memory specifications

Description	Values
Slots	Two-SODIMM slots
Type	Dual-channel DDR4
Speed	2666 MHz
Maximum memory	32 GB
Minimum memory	4 GB

Description	Values
Memory size per slot	16 GB
Configurations supported	<ul style="list-style-type: none"> 8 GB DDR4 (2 x 4 GB) 8 GB DDR4 (1 x 8 GB) 16 GB DDR4 (2 x 8 GB) 16 GB DDR4 (1 x 16 GB) 32 GB DDR4 (2 x 16 GB)

Ports and connectors

Table 4. External ports and connectors

Description	Values
External:	
Network	One RJ-45, 10/100/1000
USB	<ul style="list-style-type: none"> Two USB 3.1 Gen 1 port One USB 3.1 Gen 1 with PowerShare One USB 3.1 Gen 2 (Type-C) with Thunderbolt
Audio	One Universal Jack (headset + mic phone in + line in support) port
Video	One HDMI 2.0 port
Media card reader	One microSD- card slot
Docking port	Supported
Power adapter port	One
Security	Wedge-shaped lock slot

Table 5. Internal ports and connectors

Description	Values
Internal:	
M.2	One M.2 2280/2230 slot for solid-state drive
	<p>NOTE: To learn more about the features of different types of M.2 cards, see the knowledge base article SLN301626.</p>

Storage

Your computer supports one of the following configurations:

- 2.5-inch 5400rpm hard-disk drive
- 2.5 inch 7200rpm Hard-drive drive
- M.2 2230 solid-state drive
- M.2 2280 solid-state drive

Table 6. Storage specifications

Storage type	Interface type	Capacity
2.5-inch 5400rpm hard-disk drive	SATA up to 6 Gbps	Up to 1 TB

Storage type	Interface type	Capacity
2.5 inch 7200rpm Hard-drive drive	SATA up to 6 Gbps	Up to 1 TB
M.2 2230 solid-state drive PCIe NVMe	PCIe Gen3x2 NVMe, up to 16 Gbps	Up to 512 GB
M.2 2280 solid-state drive PCIe NVMe	PCIe Gen3x4 NVMe, up to 32 Gbps	Up to 1 TB
M.2 2280 solid-state drive Class 20	SATA Class 20	Up to 512 GB

Dimensions and weight

Table 7. Dimensions and weight

Description	Values
Height:	
Front	20.4 mm (0.8 in.)
Rear	22.85 mm (0.9 in.)
Width	323.05 mm (12.72 in.)
Depth	216 mm (8.5 in.)
Weight	1.53 kg (3.37 lb)

NOTE: The weight of your computer depends on the configuration ordered and the manufacturing variability.

Operating system

- Windows 10 Home (64-bit)
- Windows 10 Professional (64-bit)
- Windows 10 Pro for Workstations (64-bit)
- Red Hat 7.5

Communications

Ethernet

Table 8. Ethernet specifications

Description	Values
Model number	Integrated Connection I219-LM/I219-V Ethernet (RJ-45)
Transfer rate	10/100/1000

Wireless module

Table 9. Wireless module specifications

Description	Values		
Model number	Intel Dual Band Wireless AC 9560 (802.11ac) 2x2 + Bluetooth 5.0	Qualcomm QCA61x4A (DW1820) 802.11ac Dual Band (2x2) Wireless Adapter + Bluetooth 4.2	Intel AX200 + Bluetooth 5.0
Transfer rate	1.73 Gbps	<ul style="list-style-type: none"> 802.11ac - Up to 867 Mbps 802.11n - Up to 450 Mbps 802.11a/g - Up to 54 Mbps 802.11b - Up to 11 Mbps 	2400 Mbps
Frequency bands supported	2.4/ 5 GHz (160 MHz)	2.4 GHz (802.11b/g/n) and 5 GHz (802.11a/n/ac)	2.4/ 5 GHz
Wireless standards	WiFi 802.11b/g/a/n/ac,	<ul style="list-style-type: none"> 802.11a, 802.11b, 802.11g, 802.11n and 802.11ac Dual-mode Bluetooth 4.2, BLE (HW ready, SW depends on OS) 	<ul style="list-style-type: none"> WiFi 802.11a/b/g Wi-Fi 4 (WiFi 802.11n) Wi-Fi 5 (WiFi 802.11ac) Wi-Fi 6 (WiFi 802.11ax)
Encryption	64/128-bit encryption	128-bit encryption	<ul style="list-style-type: none"> 64-bit/128-bit WEP AES-CCMP TKIP
Bluetooth	Bluetooth 5.0	Bluetooth 4.2	Bluetooth 5.0

Mobile broadband

Table 10. Intel XMM 7360 Global LTE-Advanced

Description	Values
Model number	Intel XMM 7360 Global LTE-Advanced

Audio

Table 11. Audio specifications

Description	Values
Controller	Realtek ALC3204
Stereo conversion	Supported
Internal interface	Intel HDA
External interface	Universal Audio Jack
Speakers	2
Internal speaker amplifier	Supported (Audio codec built-in amplifier)
External volume controls	Keyboard shortcut controls
Speaker output:	

Description	Values
Average	2 W
Peak	2.5 W
Subwoofer output	Not supported
Microphone	Dual-array microphones

Media-card reader

Table 12. Media-card reader specifications

Description	Values
Type	<ul style="list-style-type: none"> One microSD-card slot
Cards supported	<ul style="list-style-type: none"> MicroSD

Keyboard

Table 13. Keyboard specifications

Description	Values
Type	Standard keyboard
Layout	QWERTY
Number of keys	<ul style="list-style-type: none"> United States and Canada: 81 keys United Kingdom: 82 keys Japan: 85 keys
Size	<p>X=19.05 mm (0.75 in.) key pitch</p> <p>Y=19.05 mm (0.75 in.) key pitch</p>
Shortcut keys	<p>Some keys on your keyboard have two symbols on them. These keys can be used to type alternate characters or to perform secondary functions. To type the alternate character, press Shift and the desired key. To perform secondary functions, press Fn and the desired key.</p> <p>NOTE: You can define the primary behavior of the function keys (F1–F12) changing Function Key Behavior in BIOS setup program.</p>

[Keyboard shortcuts](#)

Camera

Table 14. Camera specifications

Description	Values
Number of cameras	One
Type	<ul style="list-style-type: none"> Optional RGB HD 720p camera Optional IR camera

Description	Values
Location	Front camera
Sensor type	CMOS sensor technology
Resolution	
Camera	
Still image	HD resolution (1280 x 720)
Video	HD resolution (1280 x 720) at 30 fps
Infrared camera	
Still image	340x340
Video	340x340 at 30 fps
Diagonal viewing angle	
Camera	87 degree
Infrared camera	53 degree

Touchpad

Table 15. Touchpad specifications

Description	Values
Resolution:	
Horizontal	1221
Vertical	661
Dimensions:	
Horizontal	PCB: 101.7 mm/ active area: 99.5 mm
Vertical	PCB: 55.2 mm/ active area: 53 mm

Touchpad gestures

For more information about touchpad gestures for Windows 10, see the Microsoft knowledge base article [4027871](https://support.microsoft.com/4027871) at support.microsoft.com.

Power adapter

Table 16. Power adapter specifications

Description	Values	
Type	E5 90 W	E4 130 W
Diameter (connector)	7.4mm	7.4 mm
Input voltage	100 to 240 VAC	100 to 240 VAC
Input frequency	50 to 60 Hz	50 to 60 Hz

Description	Values	
Input current (maximum)	1.6 A	1.8 A
Output current (continuous)	4.62 A (continuous)	6.7 A (continuous)
Rated output voltage	19.5 VDC	19.5 VDC
Temperature range:		
Operating	0°C to 40°C (32°F to 104°F)	0°C to 40°C (32°F to 104°F)
Storage	-40°C to 70°C (-40°F to 158°F)	-40°C to 70°C (-40°F to 158°F)

Battery

Table 17. Battery specifications

Description	Values		
Type	3 Cell 51 WHr ExpressCharge Capable Battery	4 Cell 68 WHr ExpressCharge Capable Battery	4 Cell 68 WHr Long Cycle life Battery
Voltage	11.40 VDC	15.2 VDC	15.2 VDC
Weight (maximum)	250 g (0.55 lb)	340 g (0.75 lb)	340 g (0.75 lb)
Dimensions:			
Height	7.05 mm (0.28 in.)	7.05 mm (0.28 in.)	7.05 mm (0.28 in.)
Width	95.9 mm (3.78 in.)	95.9 mm (3.78 in.)	95.9 mm (3.78 in.)
Depth	181 mm (7.13 in.)	233 mm (9.17 in.)	233 mm (9.17 in.)
Temperature range:			
Operating	Charge: 0°C to 50°C, 32°F to 122°F; Discharge: 0°C to 60°C, 32°F to 139°F	Charge: 0°C to 50°C, 32°F to 122°F; Discharge: 0°C to 60°C, 32°F to 139°F	Charge: 0°C to 50°C, 32°F to 122°F; Discharge: 0°C to 60°C, 32°F to 139°F
Storage	-20°C to 60°C (-4°F to 140°F)	-20°C to 60°C (-4°F to 140°F)	-20°C to 60°C (-4°F to 140°F)
Operating time	Varies depending on operating conditions and can significantly reduce under certain power-intensive conditions.	Varies depending on operating conditions and can significantly reduce under certain power-intensive conditions.	Varies depending on operating conditions and can significantly reduce under certain power-intensive conditions.
Charging time (approximate)	<ul style="list-style-type: none"> Standard charge: 0°C to 50°C: 4 hours Express Charge: 0°C to 15°C: 4 hours; 16°C to 45°C: 2 hours; 46°C to 50°C: 3 hours <p>NOTE: Control the charging time, duration, start and end time, and so on using the Dell Power Manager application. For more information on the Dell Power Manager see, <i>Me and My Dell</i> on https://www.dell.com/</p>	<ul style="list-style-type: none"> Standard charge: 0°C to 50°C: 4 hours Express Charge: 0°C to 15°C: 4 hours; 16°C to 45°C: 2 hours; 46°C to 50°C: 3 hours <p>NOTE: Control the charging time, duration, start and end time, and so on using the Dell Power Manager application. For more information on the Dell Power Manager see, <i>Me and My Dell</i> on https://www.dell.com/</p>	<ul style="list-style-type: none"> Standard charge: 0°C to 50°C: 4 hours Express Charge: 0°C to 15°C: 4 hours; 16°C to 45°C: 2 hours; 46°C to 50°C: 3 hours. LCC battery only supports the standard charge. <p>NOTE: Control the charging time, duration, start and end time, and so on using the Dell Power Manager application. For more information on the Dell Power Manager see, <i>Me and My Dell</i> on https://www.dell.com/</p>

Description	Values		
Life span (approximate)	300 discharge/charge cycles	300 discharge/charge cycles	1000 discharge/charge cycle on LLC (Long life cycle) battery.
Coin-cell battery	CR-2032	CR2032	
Operating time	Varies depending on operating conditions and can significantly reduce under certain power-intensive conditions.	Varies depending on operating conditions and can significantly reduce under certain power-intensive conditions.	CR2032 Varies depending on operating conditions and can significantly reduce under certain power-intensive conditions.

Display

Table 18. Display specifications

Description	Values		
Type	High definition (HD)	Full High definition (FHD)	FHD touch panel without cover glass
Panel technology	Twisted Nematic (TN)	Wide Viewing Angle (WVA)	Wide Viewing Angle (WVA)
Luminance (typical)	220 nits	220 nits	220 nits
Dimensions (active area):			
Height	173.95 mm (6.84 in.)	173.95 mm (6.84 in.)	173.95 mm (6.84 in.)
Width	309.4 (12.18 in.)	309.4 mm (12.18 in.)	309.4 mm (12.18 in.)
Diagonal	355.6 mm (14 in.)	355.6 mm (14 in.)	355.6 mm (14 in.)
Native resolution	1366x768	1920x1080	1920 x 1080
Megapixels	1.05	2.07	2.07
Color gamut	45% (NTSC)	45% (NTSC)	45% (NTSC)
Pixels per inch (PPI)	112	157	157
Contrast ratio (min)	300:1	600:1	600:1
Response time (max)	25 ms	35 ms	35 ms
Refresh rate	60 Hz	60 Hz	60 Hz
Horizontal view angle	40(L)/40(R) degrees	80(L)/80(R) degrees	80(L)/80(R) degrees
Vertical view angle	10(U)/30(D) degrees	80(U)/80(D) degrees	80(U)/80(D) degrees
Pixel pitch	0.226 x 0.226	0.161 x 0.161	0.161 x 0.161
Power consumption (maximum)	2.4 W	2.8 W	3.15 W
Anti-glare vs glossy finish	Anti-glare	Anti-glare	Anti-glare
Touch options	No	No	Yes

Fingerprint reader (optional)

Table 19. Fingerprint reader specifications

Description	Values
Sensor technology	Capacitive
Sensor resolution	363 PPI
Sensor area	7.4 mm x 5.96 mm

Video

Table 20. Discrete graphics specifications

Discrete graphics			
Controller	External display support	Memory size	Memory type
Nvidia GeForce MX150 (TDP 25 W)	NA	VRAM 2 GB	GDDR5

Table 21. Integrated graphics specifications

Integrated graphics			
Controller	External display support	Memory size	Processor
Intel UHD Graphics 630	<ul style="list-style-type: none"> One HDMI 2.0 port One optional USB Type-C Port support VGA and DisplayPort 	Shared system memory	<ul style="list-style-type: none"> 9th Generation Intel Core i5-9300H 9th Generation Intel Core i5-9400H 9th Generation Intel Core i7-9850H

Computer environment

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

Table 22. Computer environment

	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)	10% to 95% (non-condensing)
Vibration (maximum)*	0.66 GRMS	1.37 GRMS
Shock (maximum)	140 G†	160 G‡
Altitude (maximum)	0 m to 3048 m (0 ft to 10,000 ft)	0 m to 10668 m (32 ft to 19234.4 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 23. Security

Feature	Specifications
Trusted Platform Module (TPM) 2.0	Integrated on the system board
Firmware TPM	Optional
Windows Hello Support	Yes, optional fingerprint on power button Optional IR camera
Cable lock	Noble lock
Dell Smartcard Keyboard	Optional
FIPS 140-2 certification for TPM	Yes
ControlVault 3 Advanced Authentication with FIPS 140-2 Level 3 Certification	Yes, for FPR, SC and CSC/NFC
Fingerprint Reader Only	Touch Fingerprint reader in power button tied to ControlVault 3
Contacted Smart Card and ControlVault 3	FIPS 201 Smart card reader certification/SIPR

Security options—Contacted smartcard reader

Table 24. Contacted smartcard reader

Title	Description	Dell ControlVault 3 Smartcard reader
ISO 7816 -3 Class A Card Support	Reader capable of reading 5V powered smartcard	Yes
ISO 7816 -3 Class B Card Support	Reader capable of reading 3V powered smartcard	Yes
ISO 7816 -3 Class C Card support	Reader capable of reading 1.8V powered smartcard	Yes
ISO 7816-1 Compliant	Specification for the reader	Yes
ISO 7816 -2 Compliant	Specification for smartcard device physical characteristics (size, location of connection points, etc.)	Yes
T=0 support	Cards support character level transmission	Yes
T=1 support	Cards support block level transmission	Yes
EMVCo Compliant	Compliant with EMVCo (for electronic payment standards) smartcard standards as posted to www.emvco.com	Yes
EMVCo Certified	Formally certified based on EMVCO smartcard standards	Yes
PC/SC OS interface	Personal Computer/Smart Card specification for integration of hardware readers into personal computer environments	Yes
CCID driver compliance	Common driver support for Integrated Circuit Card Interface Device for OS level drivers.	Yes

Title	Description	Dell ControlVault 3 Smartcard reader
Windows Certified	Device certified by Microsoft WHCK	Yes
FIPS 201 (PIV/HSPD-12) Compliant via GSA	Device compliant with FIPS 201/PIV/HSPD-12 requirements	Yes

Security options—Contactless smartcard reader

Table 25. Contactless smartcard reader

Title	Description	Dell ControlVault 3 Contactless Smartcard reader with NFC
Felica Card Support	Reader and software capable of supporting Felica contactless cards	Yes
ISO 14443 Type A Card Support	Reader and software capable of supporting ISO 14443 Type A contactless cards	Yes
ISO 14443 Type B Card Support	Reader and software capable of supporting ISO 14443 Type B contactless cards	Yes
ISO/IEC 21481	Reader and software capable of supporting ISO/IEC 21481 compliant contactless cards and tokens	Yes
ISO/IEC 18092	Reader and software capable of supporting ISO/IEC 21481 compliant contactless cards and tokens	Yes
ISO 15693 Card Support	Reader and software capable of supporting ISO15693 contactless cards	Yes
NFC Tag Support	Supports reading and processing of NFC compliant tag information	Yes
NFC Reader Mode	Support for NFC Forum Defined Reader mode	Yes
NFC Writer Mode	Support for NFC Forum Defined Writer mode	Yes
NFC Peer-to-Peer Mode	Support for NFC Forum Defined Peer to Peer mode	Yes
EMVCo Compliant	Compliant with EMVCO smartcard standards as posted to www.emvco.com	Yes
EMVCo Certified	Formally certified based on EMVCO smartcard standards	Yes
NFC Proximity OS Interface	Enumerates NFP (Near Field Proximity) device for OS to utilize	Yes
PC/SC OS interface	Personal Computer/Smart Card specification for integration of hardware readers into personal computer environments	Yes
CCID driver compliance	Common driver support for Integrated Circuit Card Interface Device for OS level drivers	Yes
Windows Certified	Device certified by Microsoft WHCK	Yes
Dell ControlVault support	Device connects to Dell ControlVault for usage and processing	Yes
Prox (Proximity) (125kHz) Card support	Reader and software capable of supporting Prox/Proximity/125kHz contactless cards	No

NOTE: 125 Khz proximity cards are not supported.

Table 26. Supported cards

Manufacturer	Card	Supported
HID	jCOP readertest3 A card (14443a)	Yes
	1430 1L	
	DESFire D8H	
	iClass (Legacy)	
	iClass SEOS	
NXP/Mifare	Mifare DESFire 8K White PVC Cards	Yes
	Mifare Classic 1K White PVC Cards	
	NXP Mifare Classic S50 ISO Card	
G&D	idOnDemand - SCE3.2 144K	Yes
	SCE6.0 FIPS 80K Dual+ 1 K Mifare	
	SCE6.0 nonFIPS 80K Dual+ 1 K Mifare	
	SCE6.0 FIPS 144K Dual + 1K Mifare	
	SCE6.0 nonFIPS 144K Dual + 1 K Mifare	
	SCE7.0 FIPS 144K	
Oberthur	idOnDemand - OCS5.2 80K	Yes
	ID-One Cosmo 64 RSA D V5.4 T=0 card	

Security Software

Table 27. Security Software specifications

Specifications
Dell Client Command Suite
Optional Dell Data Security and Management Software
<ul style="list-style-type: none"> · Dell Endpoint Security Suite Enterprise · Dell Data Guardian · Dell Encryption Enterprise · Dell Encryption Personal · Dell Threat Defense · MozyPro or MozyEnterprise · RSA NetWitness Endpoint · RSA SecurID Access · VMware Workspace ONE · Absolute Endpoint Visibility and Control

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.























Some keys on your keyboard have two symbols on them. These keys can be used to type alternate characters or to perform secondary functions. The symbol that is shown on the lower part of the key sees the character that is typed out when the key is pressed. If you press shift and the key, the symbol that is shown on the upper part of the key is typed out. For example, if you press **2**, 2 is typed out; if you press **Shift + 2**, @ is typed out.

The keys F1-F12 at the top row of the keyboard are function keys for multimedia control. Press the function key to invoke the task. For example, pressing F1 mutes the audio (see the table below).

However, if the function keys F1-F12 are needed for specific software applications, multimedia functionality can be disabled by pressing **Fn + Esc**. Next, multimedia control can be invoked by pressing **Fn** and the respective function key. For example, mute audio by pressing **Fn + F1**.












NOTE: You can also define the primary behavior of the function keys (F1–F12) by changing Function Key Behavior in BIOS setup program.

Table 28. List of keyboard shortcuts

Function key	Redefined key (for multimedia control)	Behavior
		Mute audio
		Decrease volume
		Increase volume
		Play previous track/chapter
		Play/Pause
		Play next track/chapter.
		Switch to external display
		Search
		Click keyboard backlight (optional).
		NOTE: Non-backlight keyboards have F10 function key without the backlight icon and do not support toggle keyboard backlight function.
		Decrease brightness
		Increase brightness

The **Fn** key is also used with selected keys on the keyboard to invoke other secondary functions.

Table 29. List of keyboard shortcuts

Function key	Behavior
	Pause/Break
	Sleep
	Click scroll lock.
	Toggle between power and battery-status light.../hard-drive activity light
	System request
	Open application menu
	Click Fn-key lock.
	Page up
	Page down
	Home
	End

Engineering specifications

Topics:

- Graphics options
- Supported hard drives
- Communications

Graphics options

Intel UHD Graphics 630

Table 30. Intel UHD Graphics 630 specifications

Intel UHD Graphics 630	
Bus Type	Integrated
Memory Type	DDR4
Graphics Level	i5/i7: GT2 (UHD 630)
Estimated Maximum Power Consumption (TDP)	15 W (included in the CPU power)
Overlay Planes	Yes
Operating Systems Graphics/ Video API Support	DirectX 12, OpenGL (4.6, 2.1)
Maximum Vertical Refresh Rate	<ul style="list-style-type: none"> • HDMI 2.0: 4096x2160 @ 60 Hz, 24bpp • Max Digital: (DP 1.2 over Type-C Port) 4096x2304 @ 60Hz, 24bpp
Number of display supported	3 display max with LCD, HDMI and plus 1 display for VGA or DP on type-C port
Multiple Display Support	On System: eDP (internal), HDMI 2.0 Via Optional Type-C Port: DisplayPort
External Connectors	HDMI 2.0 USB Type-C port

NVIDIA GeForce MX150 GDDR5

Table 31. Discrete graphics controller

Discrete graphics controller	NVIDIA GeForce MX150 GDDR5
Graphics Memory	VRAM 2 GB
Memory type	GDDR5
Bus Type	Internal PCIe 3.0
Memory Interface	64-Bit
Estimated Maximum Power Consumption	25 W

Supported hard drives

2.5 inch 500 GB 5400RPM SATA HDD

Table 32. 2.5 inch 500 GB 5400RPM SATA HDD

Capacity (GB)	500GB HDD 5400RPM
Dimensions (in.) (W x D x H)	Approximately (2.760 x 3.959 x 0.276 in.)
Interface type and Maximum speed	Up to 6 Gb/s (SATA 3.0)
MTBF	550,000 hours
Logical Blocks	976,773,168

Power Source:

Power Consumption (reference only)	Idle 0.7 W, Active 3.10 W
------------------------------------	---------------------------

Environmental Operating Conditions (Non-Condensing):

Temperature Range	5°C to 60°C
Relative Humidity Range	5% to 90%
Non-Op Shock (@0.5 ms)	350 G

Environmental Non-Operating Conditions (Non-Condensing):

Temperature Range	-40°C to 65°C
Relative Humidity Range	5% to 95%

2.5 inch 1 TB 5400RPM SATA HDD

Table 33. 2.5 inch 1 TB 5400RPM SATA HDD

Capacity (GB)	1TB HDD 5400 RPM
Dimensions (mm) (W x D x H)	Approximately (2.760 x 3.959 x 0.276 inches)
Interface type and Maximum speed	Up to 6 Gb/s (SATA 3.0)
MTBF	550,000 hours
Logical Blocks	1,953,525,168

Power Source:

Power Consumption (reference only)	Idle 0.7 W, Active 3.10 W
------------------------------------	---------------------------

Environmental Operating Conditions (Non-Condensing):

Temperature Range	5°C to 60°C
Relative Humidity Range	5% to 90%
Non-Op Shock (@0.5 ms)	350 G

Environmental Non-Operating Conditions (Non-Condensing):

Temperature Range	-40°C to 65°C
Relative Humidity Range	5% to 95%

2.5 inch 500GB 7200RPM SATA HDD

Table 34. 2.5 inch 500GB 7200RPM SATA HDD

Capacity (GB)	500GB HDD 7200RPM
Dimensions (in.) (W x D x H)	Approximately (2.760 x 3.959 x 0.276) in.
Interface type and Maximum speed	Up to 6 Gb/s (SATA 3.0)
MTBF	550,000 hours
Logical Blocks	976,773,168

Power Source:

Power Consumption (reference only)	Idle 0.7 W, Active 3.25 W
------------------------------------	---------------------------

Environmental Operating Conditions (Non-Condensing):

Temperature Range	5°C to 60°C
Relative Humidity Range	5% to 90%
Non-Op Shock (@0.5 ms)	350 G

Environmental Non-Operating Conditions (Non-Condensing):

Temperature Range	-40°C to 65°C
Relative Humidity Range	5% to 95%

2.5 inch 500GB 7200RPM SATA FIFS Self-encrypting hard drive

Table 35. 2.5 inch 500GB 7200RPM SATA FIFS Self-encrypting hard drive

Capacity (GB)	500GB 7200 SED FIFS
Dimensions (in.) (W x D x H)	Approximately (2.75 x 3.937 x 0.276) in.
Interface type and Maximum speed	Up to 6 Gb/s (SATA 3.0)
MTBF	550,000 hours
Logical Blocks	976,773,168

Power Source:

Power Consumption (reference only)	Idle 0.7 W, Active 3.25 W
------------------------------------	---------------------------

Environmental Operating Conditions (Non-Condensing):

Temperature Range	5°C to 60°C
Relative Humidity Range	5% to 90%
Non-Op Shock (@0.5 ms)	350 G

Environmental Non-Operating Conditions (Non-Condensing):

Temperature Range	-40°C to 65°C
Relative Humidity Range	5% to 95%

2.5 inch 1 TB 7200RPM SATA HDD

Table 36. 2.5 inch 1 TB 7200RPM SATA HDD

Capacity (GB)	1 TB HDD 5400 RPM
Dimensions (in.) (W x D x H)	Approximately (2.760 x 3.959 x 0.276) in.
Interface type and Maximum speed	Up to 6 Gb/s (SATA 3.0)
MTBF	550,000 hours
Logical Blocks	1,953,525,168

Power Source:

Power Consumption (reference only)	Idle 0.7 W, Active 3.25 W
------------------------------------	---------------------------

Environmental Operating Conditions (Non-Condensing):

Temperature Range	5°C to 60°C
Relative Humidity Range	5% to 90%
Non-Op Shock (@0.5 ms)	350 G

Environmental Non-Operating Conditions (Non-Condensing):

Temperature Range	-40°C to 65°C
Relative Humidity Range	5% to 95%

256 GB M.2 2280 SATA Class 20 Solid State Drive

Table 37. 256 GB M.2 2280 SATA Class 20 SSD

Capacity (GB)	256 GB
Dimensions (mm) (W x D x H)	Approximately (22 x 80 x 2.38)
Interface type and Maximum speed	Up to 6 Gb/s (SATA 3.0)
MTBF	1.4M hours
Logical Blocks	500,118,192

Power Source:

Power Consumption (reference only)	Idle 0.5 W, Active 2.5 W
------------------------------------	--------------------------

Environmental Operating Conditions (Non-Condensing):

Temperature Range	0°C to 70°C
Relative Humidity Range	10 to 90%
Non-Op Shock (@0.5 ms)	1,500G

Environmental Non-Operating Conditions (Non-Condensing):

Temperature Range	-40°C to 70°C
Relative Humidity Range	5% to 95%

512 GB M.2 2280 SATA Class 20 Solid State Drive

Table 38. 512 GB M.2 2280 SATA Class 20 SSD

Capacity (GB)	512 GB
Dimensions (mm) (W x D x H)	22 x 80 x 2.38
Interface type and Maximum speed	Up to 6 Gb/s (SATA 3.0)
MTBF	1.4M hours
Logical Blocks	1,000,215,216

Power Source:

Power Consumption (reference only)	Idle 0.5 W, Active 2.5 W
------------------------------------	--------------------------

Environmental Operating Conditions (Non-Condensing):

Temperature Range	0°C to 70°C
Relative Humidity Range	10 to 90%
Non-Op Shock (@0.5 ms)	1,500G

Environmental Non-Operating Conditions (Non-Condensing):

Temperature Range	-40°C to 70°C
Relative Humidity Range	5% to 95%

128 GB M.2 2230 PCIe Gen3x2 NVMe Class 35 Solid State Drive

Table 39. 128 GB M.2 2230 PCIe Gen3x2 NVMe Class 35 SSD

Capacity (GB)	128 GB
Dimensions (mm) (W x D x H)	(22 x 30 x 2.38) mm
Interface type and Maximum speed	PCIe Gen3 8 GT/s (up to 2 lanes)
MTBF	1.4M hours
Logical Blocks	500,118,192

Power Source:

Power Consumption (reference only)	Idle 0.5 W, Active 2.5 W
------------------------------------	--------------------------

Environmental Operating Conditions (Non-Condensing):

Temperature Range	0°C to 70°C
Relative Humidity Range	10 to 90%
Non-Op Shock (@0.5 ms)	1,500G

Environmental Non-Operating Conditions (Non-Condensing):

Temperature Range	-40°C to 70°C
Relative Humidity Range	5% to 95%

256 GB M.2 2230 PCIe Gen3x2 NVMe Class 35 Solid State Drive

Table 40. 256 GB M.2 2230 PCIe Gen3x2 NVMe Class 35 SSD

Capacity (GB)	256 GB
Dimensions (mm) (W x D x H)	(22 x 30 x 2.38) mm
Interface type and Maximum speed	PCIe Gen3 8 GT/s (up to 2 lanes)
MTBF	1.4M hours
Logical Blocks	500,118,192

Power Source:

Power Consumption (reference only)	Idle 0.5 W, Active 2.5 W
------------------------------------	--------------------------

Environmental Operating Conditions (Non-Condensing):

Temperature Range	0°C to 70°C
Relative Humidity Range	10 to 90%
Non-Op Shock (@0.5 ms)	1,500G

Environmental Non-Operating Conditions (Non-Condensing):

Temperature Range	-40°C to 70°C
Relative Humidity Range	5% to 95%

512 GB M.2 2230 PCIe Gen3x2 NVMe Class 35 Solid State Drive

Table 41. 512 GB M.2 2230 PCIe Gen3x2 NVMe Class 35 SSD

Capacity (GB)	512
Dimensions (mm) (W x D x H)	(22 x 30 x 2.38) mm
Interface type and Maximum speed	Up to 8 Gb/s (PCIe 3.0)
MTBF	1.4M hours
Logical Blocks	1,000,215,216

Power Source:

Power Consumption (reference only)	Idle 0.5 W, Active 4.5 W
------------------------------------	--------------------------

Environmental Operating Conditions (Non-Condensing):

Temperature Range	0°C to 70°C
Relative Humidity Range	10% to 90%
Non-Op Shock (@0.5 ms)	1,500G

Environmental Non-Operating Conditions (Non-Condensing):

Temperature Range	-40°C to 70°C
Relative Humidity Range	5% to 95%

256 GB M.2 2280 PCIe Gen3x4 NVMe Solid State Drive Class 40

Table 42. 256 GB M.2 2280 NVMe PCIe SSD Class 40

Capacity (GB)	256 GB
Dimensions (mm) (W x D x H)	Approximately (22 x 80 x 2.38)
Interface type and maximum speed	PCIe Gen3 8 Gb/s (up to 4 lanes)
MTBF	1.4M hours
Logical blocks	500,118,192
Power source	
Power consumption (reference only)	Idle 0.5 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)	1000 G
Environmental Non-Operating Conditions (Non-Condensing)	
Temperature range	-40°C to 70°C
Relative humidity range	5% to 95%

512 GB M.2 2280 PCIe Gen3x4 NVMe Class 40 Solid State Drive

Table 43. 512 GB M.2 2280 PCIe Gen3x4 NVMe Class 40 SSD

Capacity (GB)	512
Dimensions mm (W x D x H)	22 x 80 x 2.38
Interface type and Maximum speed	PCIe Gen3 8 Gb/s (up to 4 lanes)
MTBF	1.4M hours
Logical Blocks	1,000,215,216
Power Source:	
Power Consumption (reference only)	Idle 0.5 W, Active 4.5 W
Environmental Operating Conditions (Non-Condensing):	
Temperature Range	0°C to 70°C
Relative Humidity Range	10% to 90%
Non-Op Shock (@0.5 ms)	1,500G
Environmental Non-Operating Conditions (Non-Condensing):	
Temperature Range	-40°C to 70°C
Relative Humidity Range	5% to 95%

1 TB M.2 2280 PCIe Gen3x4 NVMe Solid State Drive Class 40

Table 44. 1 TB M.2 2280 NVMe PCIe SSD Class 40

Capacity (TB)	1 TB
Dimensions (W x D x H)	Approximately (22.00 mm x 80.00 mm x 2.38 mm)
Interface type and maximum speed	PCIe Gen3 8 Gb/s (Up to 4 lanes)
MTBF	1.4M hours
Logical blocks	2,000,409,264
Power source	
Power consumption (reference only)	Idle 0.5 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 (@2 ms)	1000 G
Environmental Non-Operating Conditions (Non-Condensing)	
Temperature range	-40°C to 70°C
Relative humidity range	5% to 95%

256 GB M.2 2280 PCIe Gen3x4 NVMe Class 40 Opal 2.0 SED Solid State Drive

Table 45. 256 GB M.2 2280 PCIe NVMe Class 40 Opal 2.0 SED SSD

Capacity (GB)	256 GB
Dimensions (mm) (W x D x H)	22 x 80 x 2.38
Interface type and Maximum speed	PCIe Gen3 8 Gb/s (up to 4 lanes)
MTBF	1.4M hours
Logical Blocks	500,118,192
Power Source:	
Power Consumption (reference only)	Idle 0.5 W, Active 4.5 W
Environmental Operating Conditions (Non-Condensing):	
Temperature Range	0°C to 70°C
Relative Humidity Range	10 to 90%
Non-Op Shock (@2 ms)	1,500G
Environmental Non-Operating Conditions (Non-Condensing):	
Temperature Range	-40°C to 70°C
Relative Humidity Range	5% to 95%

512 GB M.2 2280 PCIe Gen3x4 NVMe Class 40 Opal 2.0 SED Solid State Drive

Table 46. 512 GB M.2 2280 PCIe NVMe Class 40 Opal 2.0 SED SSD

Capacity (GB)	512 GB
Dimensions (mm) (W x D x H)	22 x 80 x 2.38
Interface type and Maximum speed	PCIe Gen3 8 Gb/s (up to 4 lanes)
MTBF	1.4M hours
Logical Blocks	1,000,215,216

Power Source:

Power Consumption (reference only)	Idle 0.5 W, Active 4.5 W
------------------------------------	--------------------------

Environmental Operating Conditions (Non-Condensing):

Temperature Range	0°C to 70°C
Relative Humidity Range	10 to 90%
Non-Op Shock (@2 ms)	1,500G

Environmental Non-Operating Conditions (Non-Condensing):

Temperature Range	-40°C to 70°C
Relative Humidity Range	5% to 95%

Communications

Communications - Integrated

Integrated Connection I219-LM/I219-V

Table 47. Integrated Connection I219-LM/I219-V

Data Rates supported	10/100/1000 Mbps
Controller Details	
Controller Bus Architecture	PCIe-based interface for S0 state, SMBus for Sx low power state
Wake On LAN	Wake-on-LAN and remote wake-up support (Magic Packet and Pattern Match)
Integrated Memory	N/A
Interface/BUS	PCIe x1
Data Transfer Mode (example: Bus-Master DMA)	N/A
Power Consumption (full operation per data rate connection speed)	542 mW (Max.)
Power Consumption (standby operation)	1000Mb/S Idle 439mW
IEEE Standards Compliance	802.3
Hardware Certifications	N/A
Boot ROM Support	EEPROM (located in SPI)

Network Transfer Mode

10BASE-T (half-duplex)	10 Mb (full/half-duplex)
100BASE-TX (half-duplex)	100 Mb (full/half-duplex)
1000BASE-T (full-duplex)	1000 Mb (full-duplex)

Environmental

Operating Temperature	0° C to 85° C (32° F to 185° F)
Operating Humidity	20% to 80% (non-condensing)
Operating System Driver Support	Win7 32/64 bit, Win 8.1/10 64 bit, Linux
Manageability	WOL, PXE
Management Capabilities Alerting	Intel vPro support with appropriate Intel chipset components

This term does not connote an actual operating speed of 1 Gb per sec. For high speed transmission, connection to a Gigabit Ethernet server and network infrastructure is required.

Wireless communication

Intel Dual Band Wireless-AC 9560 802.11ac 160 MHz 2x2 Wi-Fi + Bluetooth 5

Table 48. Intel Dual Band Wireless-AC 9560 802.11ac 160 MHz (2x2) Wi-Fi + Bluetooth 5

Host interface	Intel dual band wireless-9560
Transfer rate (max)	1.73 Gbps
Wi-Fi Alliance Certifications	WPA* and WPA2*, WPS2*, Protected Management Frames, Wi-Fi Miracast* as Source, and Wi-Fi Direct (For Microsoft Windows* only)
Frequency Bands supported	2.4/ 5 GHz (160 MHz)
Wireless Standards	WiFi 802.11b/g/a/n/ac,
Bluetooth	Bluetooth 5 (HW Ready, SW depends on operating system)
Encryption	64-bit and 128-bit WEP, TKIP, 128-bit AES-CCMP
Government Compliance	FIPS, FISMA
Antenna Diversity	Supported
Radio On/Off	Supported
Wireless PAN Standard	WiFi 802.11ac WiFi 802.11b/g/n
Bluetooth Data rates	Up to 3 Mbps
Bluetooth Operating Frequency Bands	2.4 GHz
Bluetooth Profiles Supported	Support for Microsoft Inbox Bluetooth profiles in Windows 10
Bluetooth Data Encryption	64/128-bit encryption
Bluetooth Output Power	Power class 1
Temperature	Operating temperature 0°C to + 80°C Storage temperature of -40°C to +70°C

Humidity	50% to 90% RH non-condensing (at temperatures of 25°C to 35°C)
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Qualcomm QCA61x4A 802.11ac MU-MIMO Dual Band (2x2) Wi-Fi + Bluetooth 4.2 LE M.2 Wireless Card

Table 49. Qualcomm QCA61x4A 802.11ac

Host interface	M.2 2230 form factor (Wi-Fi - PCIe , Bluetooth - USB)
Network standard	802.11a, 802.11b, 802.11g, 802.11n and 802.11ac
11ac Wave2 feature	MU-MIMO RX
Wi-Fi Alliance certifications	802.11a, 802.11b, 802.11g, WPA, WPA2 , WMM, 11ac, Wifi -Direct, WMM-Power Save, Wifi Protected Setup, Voice-Personal
Operating frequency bands	2.4 GHz (802.11b/g/n) and 5 GHz (802.11a/n/ac)
Dual diversity antenna switching (For systems designed with main and auxiliary antennas)	2x2 MIMO operation when in 802.11n mode with 2x2 or greater access point
Data rates	<ul style="list-style-type: none"> • 802.11ac - Up to 867 Mbps • ; 802.11n - Up to 450 Mbps • 802.11a/g - Up to 54 Mbps • 802.11b - Up to 11 Mbps
Receive sensitivity	<ul style="list-style-type: none"> • 802.11ac: -59 dBm @ 400 Mbps; - 57dBm @ 866.7Mbps • 802.11n/a: -67 dBm @ 300 Mbps ; -70 dBm @ 144.4Mbps • 802.11g/a: -75 dBm @ 54 Mbps • 802.11b: -85 dBm @ 11 Mbps
Security Authentication	Open, Shared, WPA, WPA-PSK, WPA2, WPA2-PSK
EAP methods	EAP-TLS, EAP-TTLS (MSCHAPv2), PEAPv0(EAP-MS-CHAPv2)
Client utility	Native Wi-Fi and Bluetooth Microsoft UI support
Software support	Microsoft WHQL certified for Windows 7/8.1 and Windows 10; Linux
Radio On/Off	Hardware and software on/off disables transmit and receive to comply with aviation in-flight restrictions
LED output	Wireless enable
Roaming	Seamless roaming between 802.11a, 802.11b, 802.11b/g, 802.11n and 802.11ac access points
Wake On wireless	Supported when using Magic Packet over the Air
Miracast (WiFi Display)	Supports Miracast (WiFi Display) on Win8.1/10
Country restrictions	All (except Tunisia)
Wireless PAN Standard	Dual-mode Bluetooth 4.2, BLE (HW ready, SW depends on OS)
Bluetooth data rates	Up to 3Mbps
Bluetooth operating frequency bands	2.4 GHz

Transmission	FHSS (Frequency Hopping Spread Spectrum)
Bluetooth data encryption	128-bit encryption
Bluetooth receive sensitivity	<ul style="list-style-type: none"> -70dBm@BER≤0.01% (EDR) -100dBm@BER≤30.8% (LE nominal)
Temperature	<ul style="list-style-type: none"> Operating temperature 0° to +65° C Storage temperature of -40° to +85° C
Humidity	Up to 90%

Intel AX200 160 MHz + Bluetooth 5.0

Table 50. Intel AX200 160 MHz + Bluetooth 5.0

Feature	Specifications
Model Number	Intel AX200
Transfer rate (Up to ____ Mbps)	2400
Frequency bands supported:	
Frequency band1 (GHz)	2.4
Frequency band2 (GHz)	5
Wireless standards:	
Wireless standards option1	WiFi 802.11a/b/g
Wireless standards option2	Wi-Fi 4 (WiFi 802.11n)
Wireless standards option3	Wi-Fi 5 (WiFi 802.11ac)
Wireless standards option4	Wi-Fi 6 (WiFi 802.11ax)
Encryption:	
Encryption option1	64-bit/128-bit WEP
Encryption option2	AES-CCMP
Encryption option3	TKIP
Bluetooth	Bluetooth 5.0

Mobile broadband

Intel XMM 7360 Global LTE-advanced

Table 51. Intel XMM 7360 Global LTE-A (DW5820e)

Carrier	Verizon	AT&T	Sprint	Rogers	Telus	Generic
Network	LTE CAT9	LTE CAT9	LTE CAT9	LTE CAT9	LTE CAT9	LTE CAT9
Speed (Downlink)	< 450 Mbps	< 450 Mbps	< 450 Mbps	< 450 Mbps	< 450 Mbps	< 450 Mbps
Speed (Uplink)	< 50 Mbps	< 50 Mbps	< 50 Mbps	< 50 Mbps	< 50 Mbps	< 50 Mbps
Fallback Network	NA	HSPA+	NA	HSPA+	HSPA+	HSPA+
Fallback Speed (Downlink)	NA	HSPA+ 42 Mbps	NA	HSPA+ 42 Mbps	HSPA+ 42 Mbps	HSPA+ 42 Mbps


Carrier	Verizon	AT&T	Sprint	Rogers	Telus	Generic
Frequency Bands	Operating band: 2, 4, 13 HSPA+: 0, 1	Operating band: 2, 4, 12, 17 HSPA+: 2, 5	Operating band: 25, 26, 41 HSPA+: 10, 1	Operating band: 1, 2, 3, 4, 5, 7, 8, 11, 12, 13, 17, 18, 19, 20, 21, 26, 28, 29, 30, 38, 39, 40, 41, 66 HSPA+: 1, 2, 4, 5, 8	Operating band: 1, 2, 3, 4, 5, 7, 8, 11, 12, 13, 17, 18, 19, 20, 21, 26, 28, 29, 30, 38, 39, 40, 41, 66 HSPA+: 1, 2, 4, 5, 8	Operating band: 1, 2, 3, 4, 5, 7, 8, 11, 12, 13, 17, 18, 19, 20, 21, 26, 28, 29, 30, 38, 39, 40, 41, 66 HSPA+: 1, 2, 4, 5, 8
SIM	Yes	Yes	Yes	Yes	Yes	Yes
LTE/WWAN Antenna	Main (Tx/Rx) + Aux (Rx/GNSS)	Main (Tx/Rx) + Aux (Rx/GNSS)	Main (Tx/Rx) + Aux (Rx/GNSS)	Main (Tx/Rx) + Aux (Rx/GNSS)	Main (Tx/Rx) + Aux (Rx/GNSS)	Main (Tx/Rx) + Aux (Rx/GNSS)
Operating System Support	Windows 10, 32/64 bits	Windows 10, 32/64 bits	Windows 10, 32/64 bits	Windows 10, 32/64 bits	Windows 10, 32/64 bits	Windows 10, 32/64 bits
Host Interface for Ubuntu	USB 3.0 and USB 2.0	USB 3.0 and USB 2.0	USB 3.0 and USB 2.0	USB 3.0 and USB 2.0	USB 3.0 and USB 2.0	USB 3.0 and USB 2.0

Getting help

Topics:

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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.