


Latitude 5521

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.

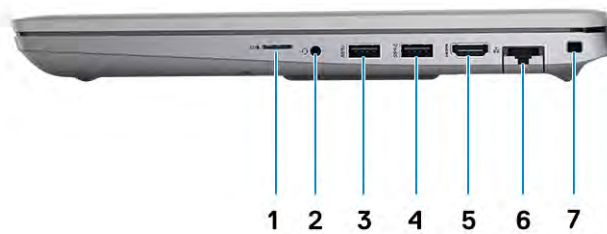
 **WARNING:** A WARNING indicates a potential for property damage, personal injury, or death.

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Views of Latitude 5521

Right view



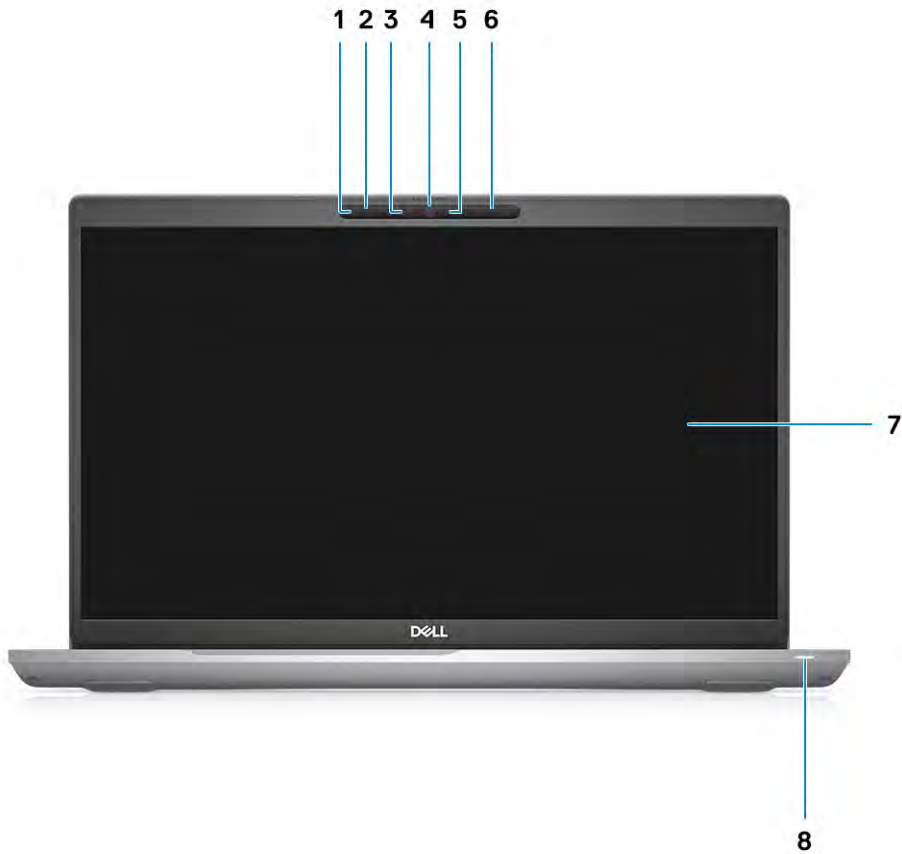
1. microSD card reader
2. Universal audio port
3. USB 3.2 Gen 1 port
4. USB 3.2 Gen 1 port with PowerShare
5. HDMI 2.0 port
6. RJ-45 Ethernet port
7. Wedge-shaped lock slot

Left



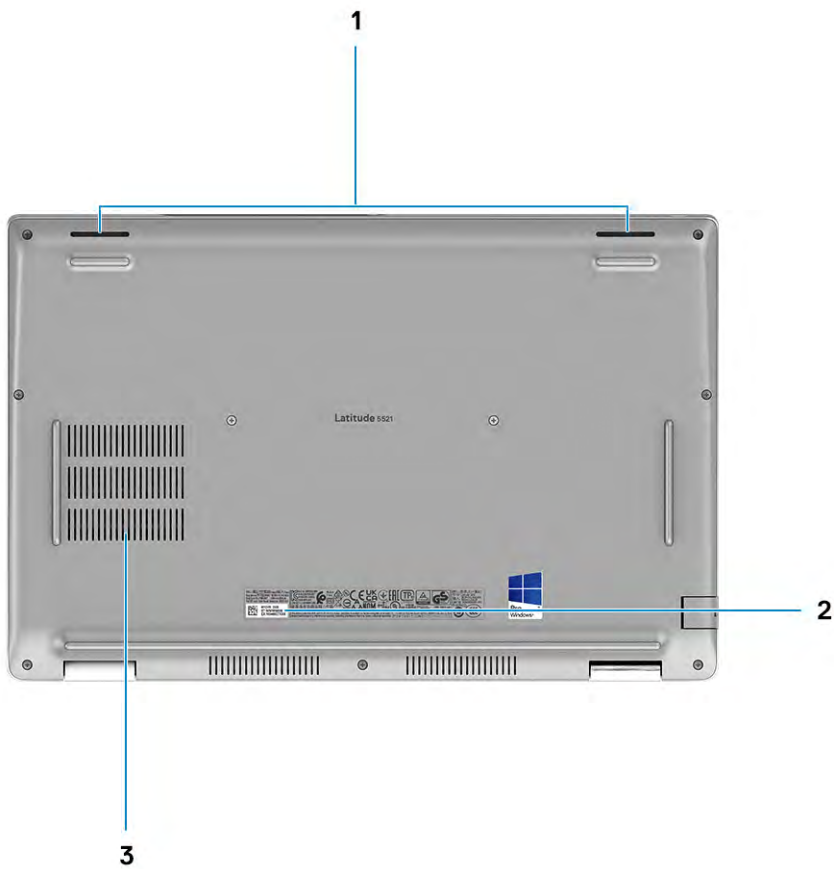
1. USB4.0 Type-C port with DisplayPort 2.0 port/Power Delivery/Thunderbolt
2. USB4.0 Type-C port with DisplayPort 2.0 port/Power Delivery/Thunderbolt
3. Fan vents
4. Smart card reader (optional)

Display



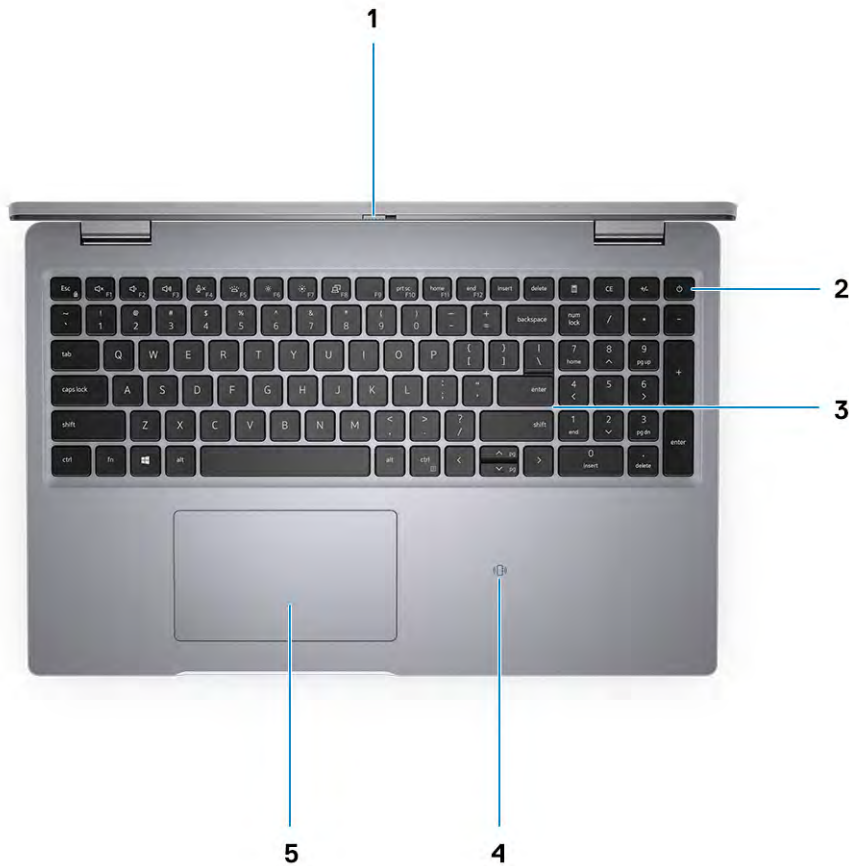
1. Proximity sensor (optional)
2. Microphone
3. IR LED (optional)
4. RGB camera/ RGB IR camera (optional)
5. Camera indicator LED (optional)
6. Microphone
7. LCD panel
8. LED activity light

Bottom view



1. Speakers
2. Service tag label
3. Fan vents

Palmrest



1. Camera shutter
2. Power button with fingerprint reader (optional)
3. Keyboard
4. Contactless smart card reader (Optional)
5. Clickpad

Battery charge and status LED

Table 1. Battery charge and status LED Indicator

Power Source	LED Behavior	computer Power State	Battery Charge Level
AC Adapter	Off	S0 - S5	Fully Charged
AC Adapter	Solid White	S0 - S5	< Fully Charged
Battery	Off	S0 - S5	11-100%
Battery	Solid Amber (590+/-3 nm)	S0 - S5	< 10%


- S0 (ON) - Computer is turned on.
- S4 (Hibernate) - The computer consumes the least power compared to all other sleep states. The computer is almost at an OFF state, expect for a trickle power. The context data is written to hard drive.
- S5 (OFF) - The computer is in a shutdown state.

Specifications of Latitude 5521

Dimensions and weight

The following table lists the height, width, depth, and weight of your Latitude 5521.

Table 2. Dimensions and weight

Description	Values
Height:	
Front height	22.67 mm (0.89 in.)
Rear height	24.05 mm (0.95 in.)
Width	357.80 mm (14.09 in.)
Depth	233.30 mm (9.19 in.)
Weight (minimum)	1.79 kg (3.95 lb)  NOTE: The weight of your computer depends on the configuration ordered and manufacturing variability.

Processor

The following table lists the details of the processors supported by your Latitude 5521.

Table 3. Processor

Description	Option one	Option two	Option three
Processor type	11 th Generation Intel Core i5-11400H	11 th Generation Intel Core i5-11500H	11 th Generation Intel Core i7-11850H
Processor wattage	45 W	45 W	45 W
Processor core count	6	6	8
Processor thread count	12	12	16
Processor speed	2.70 GHz to 4.50 GHz	2.90 GHz to 4.60 GHz	2.50 GHz to 4.80 GHz
Processor cache	12 MB	12 MB	24 MB
Integrated graphics	Intel UHD Graphics	Intel UHD Graphics	Intel UHD Graphics

Chipset

The following table lists the details of the chipset supported by your Latitude 5521.

Table 4. Chipset

Description	Values
Chipset	Intel WM590
Processor	11 th Generation Intel Core i5/i7
DRAM bus width	Two channels, 64-bit
Flash EPROM	32 MB
PCIe bus	Up to Gen 3.0

Operating system

Your Latitude 5521 supports the following operating systems:

- Windows 10 Home, 64-bit
- Windows 10 Pro, 64-bit
- Ubuntu Linux 20.04 LTS

Memory

The following table lists the memory specifications of your Latitude 5521.

Table 5. Memory specifications

Description	Values
Memory slots	Dual-channel
Memory type	DDR4
Memory speed	3200 MHz
Maximum memory configuration	64 GB
Minimum memory configuration	8 GB
Memory size per slot	8 GB, 16 GB, 32 GB
Memory configurations supported	<ul style="list-style-type: none">• 8 GB, 1 x 8 GB, DDR4, 3200 MHz• 16 GB, 1 x 16 GB, DDR4, 3200 MHz• 16 GB, 2 x 8 GB, DDR4, 3200 MHz• 32 GB, 1 x 32 GB, DDR4, 3200 MHz• 32 GB, 2 x 16 GB, DDR4, 3200 MHz• 64 GB, 2 x 32 GB, DDR4, 3200 MHz

External ports

The following table lists the external ports of your Latitude 5521.

Table 6. External ports

Description	Values
Network port	One RJ-45 port
USB ports	<ul style="list-style-type: none"> One USB 3.2 Gen 1 (Type-A) port One USB 3.2 Gen 1 (Type-A) port with PowerShare Two USB4 Type-C® port with Power Delivery/ DisplayPort/Thunderbolt™4
Audio port	One Universal Audio Jack
Video port	One HDMI 2.0 port
Media-card reader	One microSD card slot
Power-adaptor port	DC-in USB Type-C
Security-cable slot	One Wedge-shaped lock slot

Internal slots

The following table lists the internal slots of your Latitude 5521.

Table 7. Internal slots

Description	Values
M.2	<ul style="list-style-type: none"> Two M.2 2230 slots for solid-state drive 128 GB/256 GB/512 GB Two M.2 2280 slots for solid-state drive 256 GB/512 GB/1 TB/2 TB Two M.2 2280 slots for Self-Encrypting solid-state drive 256 GB/512 GB One M.2 2280 slots for 32 GB Intel® Optane™ Memory + 512 GB QLC 3D NAND NOTE: Intel® Optane™ Memory requires Gen 3 storage through Platform Controller Hub One SATA slot for 7 mm HDD 500 GB/1 TB/2 TB NOTE: To learn more about the features of different types of M.2 cards, see the knowledge base article 000144170 at www.dell.com/support.

Wireless module

The following table lists the Wireless Local Area Network (WLAN) module specifications of your Latitude 5521.

Table 8. Wireless module specifications

Description	Option one	Option two	Option three
Model number	Qualcomm QCA61x4A	Intel AX201	Intel AX210

Table 8. Wireless module specifications (continued)

Description	Option one	Option two	Option three
Transfer rate	Up to 867 Mbps	Up to 2400 Mbps	Up to 2400 Mbps
Frequency bands supported	2.4 GHz/5 GHz	2.4 GHz/5 GHz	2.4 GHz/5 GHz/6 GHz
Wireless standards	<ul style="list-style-type: none"> • Wi-Fi 802.11a/b/g • WiFi 802.11n • WiFi 802.11ac 	<ul style="list-style-type: none"> • Wi-Fi 802.11a/b/g • Wi-Fi 4 (WiFi 802.11n) • Wi-Fi 5 (WiFi 802.11ac) • Wi-Fi 6 (WiFi 802.11ax) 	<ul style="list-style-type: none"> • Wi-Fi 802.11a/b/g • Wi-Fi 4 (WiFi 802.11n) • Wi-Fi 5 (WiFi 802.11ac) • Wi-Fi 6E (WiFi 802.11ax)
Encryption	<ul style="list-style-type: none"> • 64-bit and 128-bit WEP • 128-bit AES-CCMP • TKIP 	<ul style="list-style-type: none"> • 64-bit and 128-bit WEP • 128-bit AES-CCMP • TKIP 	<ul style="list-style-type: none"> • 64-bit and 128-bit WEP • 128-bit AES-CCMP • TKIP
Bluetooth	5.0	5.2	5.2

Mobile broadband

Table 9. Intel XMM 7360 Global LTE-Advanced

Description	Values
Model number	Intel XMM 7360 Global LTE-Advanced
SIM card (Micro or Nano)	Supported ^{1,2}
eSIM card (Micro or Nano)	Supported ^{1,2}

1. Use of SIM card is supported through external SIM slot, some model support Nano card only.

2. The availability of eSIM functionality is dependent on the region and carrier requirements.

Audio

The following table lists the audio specifications of your Latitude 5521.

Table 10. Audio specifications

Description	Values
Audio controller	Realtek ALC3204 with Waves MaxxAudio Pro
Stereo conversion	24-bit DAC (Digital-to-Analog) and ADC (Analog-to-Digital)
Internal audio interface	Intel HDA (high-definition audio)
External audio interface	Universal audio jack
Number of speakers	2
Internal-speaker amplifier	Supported (audio codec integrated)
External volume controls	Keyboard shortcut controls
Speaker output:	
Average speaker output	2 W

Table 10. Audio specifications (continued)

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

Storage

This section lists the storage options on your Latitude 5521.

Your computer supports one of the following configurations:

- One 2.5-inch hard drive
- Two M.2 2230/2280 solid state drive

The primary drive of your computer varies with the storage configuration. For computers:

- with a M.2 drive, the M.2 drive is the primary drive
- without a M.2 drive, the 2.5-inch hard drive is the primary drive

Table 11. Storage specifications

Storage type	Interface type	Capacity
2.5-inch 5400 rpm SATA hard-disk drive	SATA up to 6 Gbps	up to 2 TB
2.5-inch 7200 rpm SATA hard-disk drive	SATA up to 6 Gbps	up to 1 TB
2.5-inch 7200 rpm SED SATA hard-disk drive	SATA AHCI, up to 6 Gbps	500 GB
M.2 2230 solid-state drive PCIe NVMe	PCIe Gen3x4 NVMe, up to 32 Gbps	up to 512 GB
M.2 2280 solid-state drive PCIe NVMe	PCIe Gen3x4/Gen4x4 NVMe, up to 32 Gbps	up to 2 TB
M.2 2280 Opal Self Encrypting solid-state drive PCIe NVMe	PCIe Gen3x4 NVMe, up to 32 Gbps	1 TB

Intel Optane memory

Intel Optane memory functions only as a storage accelerator. It neither replaces nor adds to the memory (RAM) installed on your computer.

NOTE: Intel Optane memory is supported on computers that meet the following requirements:

- 7th Generation or higher Intel Core i3/i5/i7 processor
- Windows 10 64-bit version or higher (Anniversary Update)
- Latest version of Intel Rapid Storage Technology driver

Table 12. Intel Optane memory

Description	Values
Type	Memory/Storage/Storage accelerator
Interface	PCIe Gen3.0x4
Connector	M.2 2280


Table 12. Intel Optane memory (continued)

Description	Values
Configurations supported	32 GB, 512 GB
Capacity	Up to 512 GB

Media-card reader

The following table lists the media cards supported by your Latitude 5521.


Table 13. Media-card reader specifications

Description	Values
Media-card type	microSD card slot
Media-cards supported	<ul style="list-style-type: none"> • Micro Secure Digital (mSD) • Micro Secure Digital High Capacity (mSDHC) • Micro Secure Digital Extended Capacity (mSDXC)
 NOTE: The maximum capacity supported by the media-card reader varies depending on the standard of the media card installed in your computer.	

Keyboard

The following table lists the keyboard specifications of your Latitude 5521.

Table 14. Keyboard specifications

Description	Values
Keyboard type	<ul style="list-style-type: none"> • Standard keyboard • RGB backlit keyboard
Keyboard layout	QWERTY
Number of keys	<ul style="list-style-type: none"> • United States and Canada: 102 keys • United Kingdom: 103 keys • Japan: 106 keys
Keyboard size	X=18.6 mm key pitch Y=19.05 mm key pitch
Keyboard shortcuts	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.  NOTE: You can define the primary behavior of the function keys (F1–F12) changing Function Key Behavior in BIOS setup program. Keyboard shortcuts

Clickpad

The following table lists the Clickpad specifications of your Latitude 5521.

Table 15. Clickpad specifications

Description	Values
Clickpad resolution:	>300 dpi
Clickpad dimensions:	
Horizontal	115 mm (4.53 in.)
Vertical	67 mm (2.64 in.)
Clickpad gestures	For more information about Clickpad gestures available on Windows 10, see the Microsoft knowledge base article 4027871 at support.microsoft.com .

Camera

The following table lists the camera specifications of your Latitude 5521.



Table 16. Camera specifications

Description	Option 1	Option 2	Option 3
Number of cameras	One	One	One
Camera type	<ul style="list-style-type: none"> RGB HD camera 	HD RGB + Ir camera	FHD RGB + Ir camera, proximity sensor/express sign-in
Camera location	Front camera	Front camera	Front camera
Camera sensor type	CMOS sensor technology	CMOS sensor technology	CMOS sensor technology
Camera resolution:			
Still image	5 megapixel	0.92 megapixel	2.07 megapixels
Video	1280 x 720 (VGA/HD) at 30 fps	1280 x 720 (HD) at 30 fps	1920 x 1080 (FHD) at 30 fps
Infrared camera resolution:			
Still image	N/A	0.23	0.23
Video	N/A	640 x 360 at 15 fps	640 x 360 at 15 fps
Diagonal viewing angle:			
Camera	78.6 degrees	87 degrees	87.60 degrees
Infrared camera	87 degrees	87 degrees	87.60 degrees

Power adapter

The following table lists the power adapter specifications of your Latitude 5521.

Table 17. Power adapter specifications

Description	Option one	Option two
Type	90 W AC adapter, USB-C	130 W AC adapter, USB-C
	 NOTE: 90 W is supported only in UMA configuration.	
Input voltage	100 VAC x 240 VAC	100 VAC x 240 VAC
Input frequency	50 Hz x 60 Hz	50 Hz x 60 Hz
Input current (maximum)	1.50 A	1.80 A
Output current (continuous)	<ul style="list-style-type: none"> • 20 V/4.50 A • 15 V/3 A • 9 V/3 A • 5 V/ 3 A 	<ul style="list-style-type: none"> • 20 V/6.50 A • 5 V/1 A
Rated output voltage	20 VDC/15 VDC/9 VDC/5 VDC	20 VDC/5 VDC
Weight	0.64 lbs (0.29 kg)	0.77 lbs (0.35 kg)
Dimensions (inches)	0.87 x 2.60 x 5.12	0.87 x 2.60 x 5.63
Dimensions (mm)	22 x 66 x 130	22 x 66 x 143
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)
	 CAUTION: Operating and storage temperature ranges may differ among components, so operating or storing the device outside these ranges may impact the performance of specific components.	

Battery

The following table lists the battery specifications of your Latitude 5521.

Table 18. Battery specifications

Description	Option one	Option two	Option three
Battery type	4-cell 64 WHr, Polymer, Long Cycle Life, ExpressCharge capable	4-cell 64 WHr, Polymer, non-Long Cycle Life, ExpressCharge capable	6 Cell 97 WHr ExpressCharge capable
Battery voltage	15.20 V	15.20 V	11.40 VDC
Battery weight (maximum)	0.283 kg (0.62 lb)	0.283 kg (0.62 lb)	0.429 kg (0.95 lb)
Battery dimensions:			

Table 18. Battery specifications (continued)

Description		Option one	Option two	Option three
	Height	7.60 mm	7.60 mm	7.70 mm (0.30 in.)
	Width	226.60 mm	226.60 mm	332 mm (13.1 in.)
	Depth	81.40 mm	81.40 mm	82.00 mm (3.22 in.)
Temperature range:				
	Operating	<ul style="list-style-type: none"> • Charge: 0 °C to 45 °C, 32 °F to 113 °F • Discharge: 0 °C to 70 °C, 32 °F to 158 °F 	<ul style="list-style-type: none"> • Charge: 0 °C to 45 °C, 32 °F to 113 °F • Discharge: 0 °C to 70 °C, 32 °F to 158 °F 	0°C to 50°C (32°F to 122°F)
	Storage	-20°C (-4°F) to 65°C (149°F)	-20°C (-4°F) to 65°C (149°F)	-20°C to 60°C (-4°F to 140°F)
Battery 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.
Battery charging time (approximate)		4Hrs hours (when the computer is off) ⓘ 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 www.dell.com/	4Hrs hours (when the computer is off) ⓘ 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 www.dell.com/	4 Hrs hours (when the computer is off) ⓘ 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 www.dell.com/
Approximate life span (discharge/charge cycles)		<ul style="list-style-type: none"> • 3 years warranty 	<ul style="list-style-type: none"> • 1 year warranty 	<ul style="list-style-type: none"> • 1 year warranty

Table 18. Battery specifications (continued)

Description	Option one	Option two	Option three
Coin-cell battery	CR2032	CR2032	CR2032

Display

The following table lists the display specifications of your Latitude 5521.

Table 19. Display specifications

Description	Option one	Option two	Option three	Option four	Option five
Display type	High Definition (HD)	Full High Definition (FHD)	Full High Definition (FHD) Touch	Full High Definition (FHD), Super Low Power (SLP), Low Blue Light	Ultra High Definition (UHD), Super Low Power (SLP), Low Blue Light
Display-panel technology	Twisted Nematic (TN)	Wide Viewing Angle (WVA)	Wide Viewing Angle (WVA)	Wide Viewing Angle (WVA)	Wide-Viewing Angle (WVA)
Display-panel dimensions (active area):					
Height	193.60 mm (7.62 in.)	193.60 mm (7.62 in.)	193.60 mm (7.62 in.)	193.60 mm (7.62 in.)	193.60 mm (7.62 in.)
Width	344.20 mm (13.55 in.)	344.20 mm (13.55 in.)	344.20 mm (13.55 in.)	344.20 mm (13.55 in.)	344.20 mm (13.55 in.)
Diagonal	394.91 mm (15.55 in.)	394.91 mm (15.55 in.)	394.91 mm (15.55 in.)	394.91 mm (15.55 in.)	394.91 mm (15.55 in.)
Display-panel native resolution	1366x768	1920 x 1080	1920 x 1080	1920 x 1080	3840 x 2160
Luminance (typical)	220 nits	250 nits	250 nits	400 nits	400 nits
Megapixels	1049088	2073600	2073600	2073600	8.3
Color gamut	NTSC 45%	NTSC 45%	NTSC 45%	sRGB 100%	sRGB 100%
Pixels Per Inch (PPI)	100	141	141	141	140
Contrast ratio (typ)	500:1	700:1	700:1	700:1	800:1
Response time (min)	25 ms	25 ms	35 ms	35 ms	35 ms
Refresh rate	60 Hz	60 Hz	60 Hz	60 Hz	60 Hz
Horizontal view angle	40/40 +/- degrees	80/80 +/- degrees	80/80 +/- degrees	80/80 +/- degrees	80 minimum
Vertical view angle	10(U)/30(D) +/- degrees	80(U)/80(D) +/- degrees	80(U)/80(D) +/- degrees	80(U)/80(D) +/- degrees	80 minimum
Pixel pitch	0.252X0.252 mm	0.179X0.179 mm	0.179X0.179 mm	0.179X0.179 mm	0.161 x 0.161

Table 19. Display specifications (continued)

Description	Option one	Option two	Option three	Option four	Option five
Power consumption (maximum)	4.20 W	4.2 W	4.2 W	4.6 W	3.50 W
Anti-glare vs glossy finish	Anti-glare	Anti-glare	Anti-glare	Anti-glare	Anti-glare
Touch options	No	No	Yes	No	No

Fingerprint reader (optional)

The following table lists the specifications of the optional fingerprint-reader of your Latitude 5521.

Table 20. Fingerprint reader specifications

Description	Values
Fingerprint-reader sensor technology	Capacitive
Fingerprint-reader sensor resolution	508 dpi
Fingerprint-reader sensor pixel size	256 x 360

GPU—Integrated

The following table lists the specifications of the integrated Graphics Processing Unit (GPU) supported by your Latitude 5521.

Table 21. GPU—Integrated

Controller	External display support	Memory size	Processor
Intel UHD Graphics	HDMI 2.0 port/ USB Type-C with DisplayPort 2.0 port	Shared system memory	11 th Generation Intel core i5/i7

GPU—Discrete

The following table lists the specifications of the discrete Graphics Processing Unit (GPU) supported by your Latitude 5521.

Table 22. GPU—Discrete

Controller	External display support	Memory size	Memory type
NVIDIA GeForce MX450	HDMI 2.0 port/ USB Type-C with DisplayPort 2.0 port	2 GB	GDDR6

Sensor and control specifications

Table 23. Sensor and control specifications

Specifications
1. Accelerometer: One on the system board
2. Accelerometer with Gyro: On the hinge-up (optional)
3. GPS (via WWAN Card only) (optional)

Table 23. Sensor and control specifications (continued)

Specifications
4. Proximity sensor (optional)

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
Windows Certified	Device certified by 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

Table 25. Contactless smartcard reader (continued)

Title	Description	Dell ControlVault 3 Contactless Smartcard reader with NFC
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

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

Table 26. Supported cards (continued)

Manufacturer	Card	Supported
	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

Table 27. Security specifications

Features	Specifications
Trusted Platform Module (TPM) 2.0	Integrated on system board
Fingerprint reader	Optional
Wedge-shaped lock slot	Standard

Security Software

Table 28. Security Software specifications

Specifications
Dell Client Command Suite
Optional Dell Data Security and Management Software <ul style="list-style-type: none"> • Dell Client Command Suite • Dell BIOS Verification • Optional Dell Endpoint Security and Management Software • VMware Carbon Black Endpoint Standard • VMware Carbon Black Endpoint Standard + Secureworks Threat Detection and Response • Dell Encryption Enterprise • Dell Encryption Personal • Carbonite • VMware Workspace ONE • Absolute Endpoint Visibility and Control • Netskope • Dell Supply Chain Defense

Computer environment

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

Table 29. Computer environment

Description	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 80% (non-condensing)	0% to 95% (non-condensing)
Vibration (maximum)*	0.66 GRMS	1.30 GRMS
Shock (maximum)	140 G†	160 G†
Altitude (maximum)	0 m to 3048 m (4.64 ft to 5518.4 ft)	0 m to 10668 m (4.64 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.

Engineering specifications

Communications

Communications - Integrated

Integrated Connection I219-LM/I219-V

Table 30. 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 LAN options

Qualcomm QCA61x4A 802.11ac dual band 2x2 + Bluetooth 5.0

Table 31. Qualcomm QCA61x4A 802.11ac dual band 2x2 + Bluetooth 5.0 specifications

Feature	Values
Host interface	M.2 2230 form factor: <ul style="list-style-type: none"> ● Wi-Fi: PCIe ● Bluetooth: USB
Network standard	IEEE 802.11a/b/g/n/ac/, MU-MIMO
Wi-Fi alliance certifications	<ul style="list-style-type: none"> ● Wi-Fi Certified a/b/g/n/ac with wave 2 features ● WMM ● WPA2 ● Protected Management Frames ● Wi-Fi Direct (For Windows only)
Operating frequency bands	<ul style="list-style-type: none"> ● 2.4 Ghz ● 5 Ghz
Data rate	<ul style="list-style-type: none"> ● 2.4 GHz 40M - Up to 300 Mbps ● 5 GHz 80M - Up to 867 Mbps
Power consumption	Optimized power modes (sleep states) reduce power consumption during periods of inactivity
Authentication	WPA2 Personal and Enterprise
Authentication protocols	<ul style="list-style-type: none"> ● 802.1X EAP-TLS ● EAP-TTLS/MSCHAPv2 ● PEAPv0 -MSCHAPv2 (EAP-SIM, EAP-AKA, EAP-AKA)
Encryption	<ul style="list-style-type: none"> ● 64-bit and 128-bit WEP ● TKIP ● 128-bit AES-CCMP ● 256-bit AES-GCMP
Product safety	<ul style="list-style-type: none"> ● UL ● C-UL ● CB(IEC60950-1)
Government compliance	<ul style="list-style-type: none"> ● FIPS 140-2 ● FISMA
Antenna diversity	Supported
Radio On/Off	Supported
Roaming	Support seamless roaming between access points
Wake On wireless	Supported
Wireless display	Native Miracast support by Windows 10
Bluetooth version	Bluetooth 5.0

Table 31. Qualcomm QCA61x4A 802.11ac dual band 2x2 + Bluetooth 5.0 specifications (continued)

Feature	Values
Bluetooth data rates	Up to 2 Mbps
Bluetooth operating frequency bands	2.4 GHz
Bluetooth profiles supported	Support for Microsoft Inbox Bluetooth profiles in Windows 10
Bluetooth data encryption	128-bit encryption
Bluetooth output power	Power class 1
Temperature	<ul style="list-style-type: none"> Operating temperature -10°C to + 65°C (Full performance at shield temperatures up to 85°C) Storage temperature of -10°C to + 85°C
Humidity	Up to 90% RH non-condensing (at temperatures of 25°C to 35°C)

Intel Wi-Fi 6 AX201 2x2 (Gig+) + Bluetooth 5.2

Table 32. Intel Wi-Fi 6 AX201 2x2 (Gig+) + Bluetooth 5.2 specifications

Feature	Values
Host interface	M.2 2230 form factor: <ul style="list-style-type: none"> CNVI2 (Connectivity Integration 2nd generation)
Network standard	IEEE 802.11a/b/g/n/ac/ax, 160MHz channel use, MU-MIMO
Wi-Fi alliance certifications	<ul style="list-style-type: none"> Wi-Fi Certified a/b/g/n/ac with wave 2 features Designed to be Wi-Fi Certified ax (Wi-Fi 6) WMM WMM-PS WPA WPA2 WPS2 Protected Management Frames Wi-Fi Direct (For Windows only)
Operating frequency bands	<ul style="list-style-type: none"> 2.4 Ghz 5 Ghz
Data rate	<ul style="list-style-type: none"> 2.4 GHz 40M - Up to 574 Mbps 5 GHz 80M - Up to 1.2 Gbps 5 GHz 160M - Up to 2.4 Gbps
Power consumption	Optimized power modes (sleep states) reduce power consumption during periods of inactivity
Authentication	<ul style="list-style-type: none"> WPA and WPA2 Personal and Enterprise WPA3 (pending OS support)
Authentication protocols	<ul style="list-style-type: none"> 802.1X EAP-TLS EAP-TTLS/MSCHAPv2 PEAPv0 -MSCHAPv2 (EAP-SIM, EAP-AKA, EAP-AKA)
Encryption	<ul style="list-style-type: none"> 64-bit and 128-bit WEP TKIP 128-bit AES-CCMP 256-bit AES-GCMP

Table 32. Intel Wi-Fi 6 AX201 2x2 (Gig+) + Bluetooth 5.2 specifications (continued)

Feature	Values
Product safety	<ul style="list-style-type: none"> • UL • C-UL • CB(IEC60950-1)
Management capabilities alerting	Support for Intel AMT
Government compliance	<ul style="list-style-type: none"> • FIPS 140-2 • FISMA
Client utility	Intel PRO/Set Wireless Software v21 and later
Antenna diversity	Supported
Radio On/Off	Supported
Roaming	Support seamless roaming between access points
Wake On wireless	Supported
Wireless display	Native Miracast support by Windows 10
Wireless PAN standard	Dual Mode Bluetooth 5.2, BLE
Bluetooth version	Bluetooth 5.2
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	128-bit encryption
Bluetooth output power	Power class 1
Temperature	<ul style="list-style-type: none"> • Operating temperature 0°C to + 50°C (Full performance at shield temperatures up to 80°C) • Storage temperature of -40°C to +70°C
Humidity	Up to 90% RH non-condensing (at temperatures of 25°C to 35°C)

Intel Wi-Fi 6 AX210 160 MHz (Typhoon Peak 2) 2x2 Wi-Fi and Bluetooth 5.2 M.2 wireless card

Table 33. Intel Wi-Fi 6 AX210 160 MHz (Typhoon Peak 2) 2x2 Wi-Fi and Bluetooth 5.2 M.2 wireless card

Feature	Specifications
Type	Intel AX210
Network standard	IEEE 802.11a/b/g/n/ac/ax, 160 MHz channel use, MU-MIMO
Wi-Fi Alliance certifications	Wi-Fi CERTIFIED* a/b/g/n/ac with wave 2 features, designed to be Wi-Fi CERTIFIED* ax (Wi-Fi 6), WMM*, WMM-PS*, WPA*, WPA2*, WPS2*, Protected Management Frames, and Wi-Fi Direct (For Microsoft Windows* only)
Transfer rate	Up to 2400 Gbps

Table 33. Intel Wi-Fi 6 AX210 160 MHz (Typhoon Peak 2) 2x2 Wi-Fi and Bluetooth 5.2 M.2 wireless card (continued)

Feature	Specifications
Operating Frequency Bands	2.4 GHz, 5 GHz, and 6 GHz
Data Rate	<ul style="list-style-type: none"> • 2.4 GHz 40 M - Up to 574 Mbps • 5/6 GHz 80 M - Up to 1.2 Gbps • 5/6 GHz 160 M - Up to 2.4 Gbps
Power consumption	Optimized power modes (sleep states) reduce power consumption during periods of inactivity.
Authentication	WPA* and WPA2* Personal and Enterprise; WPA3* (pending operating system support)
Authentication Protocols	802.1X EAP-TLS, EAP-TTLS/MSCHAPv2, PEAPv0 -MSCHAPv2 (EAP-SIM, EAP-AKA, EAP-AKA')
Encryption	64-bit and 128-bit WEP, TKIP, 128-bit AES-CCMP, 256-bit AES-GCMP
Government Compliance	FIPS 140-2, FISMA
Client Utility	Intel PRO/Set Wireless Software v22 and later
Antenna Diversity	Supported
Radio On/Off	Supported
Roaming	Support seamless roaming between access points
Wake On Wireless	Supported
Wireless Display	Native Miracast* support by Windows 10
Wireless PAN Standard	Dual Mode bluetooth 5.2, BLE
Bluetooth	5.2
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	128-bit encryption
Bluetooth Output Power	Power class 1
Temperature	<ul style="list-style-type: none"> • Operating temperature 0°C to + 50°C (Full performance at shield temperatures up to 80°C) • Storage temperature of -40°C to +70°C
Humidity	Up to 90% RH non-condensing (at temperatures of 25°C to 35°C)

Mobile broadband

Intel XMM 7360 Global LTE-Advanced (DW5820e) CAT9, WWAN Module

Feature	Specifications
Host interface	M.2 3042 form factor
Network standard	LTE FDD/TDD, WCDMA/HSPA+, GNSS/Beidou
Transfer rate	Up to 450 Mbps DL/50 Mbps UL (Cat 9)

Feature	Specifications
Operating FrequencyBands	(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)
Data Rate	<ul style="list-style-type: none"> • LTE FDD: 450 Mbps DL/50 Mbps UL (Cat 9) • LTE TDD: 347 Mbps DL/30 Mbps UL (Cat 9) • UMTS/HSPA+: UMTS 384 kbps DL/384 kbps UL
Power supply	DC 3.135 V to 4.4 V, Typical 3.3 V
SIM card (Micro or Nano)	Supported ¹
eSIM card (Micro orNano)	Supported ^{1,2}
Antenna Diversity	Supported
Radio On/Off	Supported
Wake On Wireless	Supported
Temperature	<ul style="list-style-type: none"> • Normal operating temperature: -10°C to + 55°C • Extended Operating temperature: -20°C to +65°C
Antenna connector	<ul style="list-style-type: none"> • WWAN Main Antenna x1 • WWAN Diversity Antenna x1
<p>NOTE:</p> <ul style="list-style-type: none"> • ¹ Use of SIM card is supported through external SIM slot, some model support Nano card only. • ² The availability of eSIM functionality depends on the region and carrier requirements. 	

Graphics options

Intel UHD Graphics

Table 34. Intel UHD Graphics specifications

Intel UHD Graphics	
Bus Type	Integrated
Memory Type	DDR4
Graphics Level	i5/i7: GT2 (UHD)
Estimated Maximum Power Consumption (TDP)	35 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 1.4 over Type-C Port) 4096x2304 @ 60Hz, 24bpp
Number of display supported	3 display max with HDMI, 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 MX450

Table 35. NVIDIA GeForce MX450

Feature	Specifications
Bus type	PCIe 4.0
Memory type	GDDR6
Memory size	2 GB
Memory interface	64 bit
Estimated Maximum Power Consumption (TDP)	25 W
Maximum color depth	NA
Multiple display support	NA
Maximum vertical refresh rate	NA
External connectors	NA

Video port and resolution matrix

Table 36. Video port and resolution matrix

Port type	HDMI 2.0 port x1	Thunderbolt 4 port x2 type C-DP port
Maximum resolution —single display	4K 60 Hz HDR	<ul style="list-style-type: none"> 4K 60 Hz HDR with single type C port, or 8K 60 Hz SDR with dual type C cables (tiled mode)
Maximum resolution —dual display	<ul style="list-style-type: none"> 1 x 4K 60 Hz HDR (HDMI 2.0) +1 x 8K 60 Hz SDR with dual type C cables (tiled mode), or 1 x 4K 60 Hz HDR (HDMI 2.0) +1 x 4K 60 Hz HDR (type C-DP) 	
Maximum resolution —triple display	3 x 4K 60 Hz HDR	
Maximum resolution —four display	4 x 4K 60 Hz HDR (One through external MST hub)	

Supported hard drives

2.5-inch 1 TB 5400 RPM SATA Hard Drive

Table 37. 2.5-inch 1 TB 5400 RPM SATA Hard Drive

Capacity (GB)	1 TB HDD 5400 RPM
Dimensions (W x D x H)	Approximately (2.75 in. x 3.937 in. 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 3.10 W

Table 37. 2.5-inch 1 TB 5400 RPM SATA Hard Drive (continued)

Environmental Operating Conditions (Non-Condensing)	
Temperature range	5°C to 60°C
Relative humidity range	5% to 90%
Op shock (@ 2ms)	350 G
Environmental Non-Operating Conditions (Non-Condensing)	
Temperature range	-40°C to 65°C
Relative humidity range	5% to 95%

2.5-inch 2 TB 5400 RPM SATA Hard Drive

Table 38. 2.5-inch 2 TB 5400 RPM SATA Hard Drive

Capacity (GB)	2 TB HDD 5400 RPM
Dimensions (W x D x H)	Approximately (2.75 in. x 3.937 in. x 0.276 in.)
Interface type and maximum speed	Up to 6 Gb/s (SATA 3.0)
MTBF	550,000 hours
Logical blocks	3,907,029,168
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%
Op shock (@ 2ms)	350 G
Environmental Non-Operating Conditions (Non-Condensing)	
Temperature range	-40°C to 65°C
Relative humidity range	5% to 95%

2.5-inch 500 GB 7200 RPM SATA Hard-Disk Drive

Table 39. 2.5-inch 500 GB 7200 RPM SATA Hard-Disk Drive

Features	Specifications
Capacity (GB)	500 GB HDD 7200 RPM
Dimensions (W x D x H)	2.75 in. x 3.955 in. x 0.276 in.
Interface type and Maximum speed	Up to 6 Gb/s (SATA 3.0)
MTBF	550,000 hours

Table 39. 2.5-inch 500 GB 7200 RPM SATA Hard-Disk Drive (continued)

Features	Specifications
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%
Op Shock (@2 ms)	350G
Environmental Non-Operating Conditions (Non-Condensing):	
Temperature Range	-40°C to 65°C
Relative Humidity Range	5 to 95%

2.5-inch 1 TB 7200 RPM SATA Hard Drive

Table 40. 2.5-inch 1 TB 7200 RPM SATA Hard Drive

Capacity (GB)	1 TB HDD 7200 RPM
Dimensions (W x D x H)	Approximately (2.76 in. x 3.959 in. 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%
Op shock (@ 2ms)	350 G
Environmental Non-Operating Conditions (Non-Condensing)	
Temperature range	-40°C to 65°C
Relative humidity range	5% to 95%

2.5-inch 500 GB 7200 RPM SED FIPS SATA Hard Drive

Table 41. 2.5-inch 500 GB 7200 RPM SED FIPS SATA Hard Drive

Capacity (GB)	500 GB HDD 7200 RPM
Dimensions (W x D x H)	Approximately (2.76 in. x 3.94 in. x 0.28 in.)

Table 41. 2.5-inch 500 GB 7200 RPM SED FIPS SATA Hard Drive (continued)

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%
Op shock (@ 2ms)	350 G
Environmental Non-Operating Conditions (Non-Condensing)	
Temperature range	-40°C to 65°C
Relative humidity range	5% to 95%

128 GB M.2 2230 PCIe Gen3x4 NVMe Class 35 Solid-State Drive

Table 42. 128 GB M.2 2230 PCIe Gen3x4 NVMe Class 35 SSD

Features	Specifications
Capacity (GB)	128 GB
Dimensions (mm) (W x D x H)	(22 x 80 x 2.38) mm
Interface type and Maximum speed	PCIe Gen3 32 Gb/s (up to 4 lanes)
Mean Time Between Failures (MTBF)	1.4M hours
Logical Blocks	250,069,680
Power Source:	
Power Consumption (reference only)	Idle 5 mW (PS4), Active 3.5 W
Environmental Operating Conditions (Non-Condensing):	
Temperature Range	0°C–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 Gen3x4 NVMe Class 35 Solid-State Drive

Table 43. 256 GB M.2 2230 PCIe Gen3x4 NVMe Class 35 SSD

Features	Specifications
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 32 Gb/s (up to 4 lanes)
MTBF	1.4M hours
Logical Blocks	500,118,192
Power Source:	
Power Consumption (reference only)	Idle 5 mW (PS4), Active 3.5 W
Environmental Operating Conditions (Non-Condensing):	
Temperature Range	0°C–70°C
Relative Humidity Range	10–90%
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 Gen3x4 NVMe Class 35 Solid State Drive

Table 44. 512 GB M.2 2230 PCIe Gen3x4 NVMe Class 35 Solid State Drive

Capacity	512 GB
Dimensions	22.00 mm x 30.00 mm x 2.38 mm
Interface type and maximum speed	Gen 3 PCIe 32 Gb/s (Up to 4 lanes)
MTTF	1.4 M hours
Logical blocks	1,000,215,216
Power Source	
Power consumption (reference only)	<ul style="list-style-type: none"> ● Idle : 5 mW (PS4) ● Active : 3.5 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)	1500G
Environmental Non-Operating Conditions (Non-Condensing)	
Temperature range	-40°C to 70°C

Table 44. 512 GB M.2 2230 PCIe Gen3x4 NVMe Class 35 Solid State Drive (continued)

Relative humidity range	5% to 95%
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256 GB M.2 2280 PCIe Gen3x4 NVMe Class 40 Solid State Drive

Table 45. 256 GB M.2 2280 PCIe Gen3x4 NVMe Class 40 Solid State Drive

Capacity (GB)	256 GB
Dimensions (W x D x H)	Approximately (22.00 in. x 80.00 in. x 2.38 in.)
Interface type and maximum speed	PCIe Gen3 32 Gb/s (up to 4 lanes)
MTBF	1.4M hours
Logical blocks	500,118,192
Power source	
Power consumption (reference only)	Idle 5 mW, 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)	1500 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 46. 512 GB M.2 2280 PCIe Gen3x4 NVMe Class 40 SSD

Features	Specifications
Capacity (GB)	512 GB
Dimensions (mm) (W x D x H)	(22 x 80 x 2.38) mm
Interface type and Maximum speed	PCIe Gen3 32 Gb/s (up to 4 lanes)
Mean Time Between Failures (MTBF)	1.4M hours
Logical Blocks	1,000,215,216
Power Source:	
Power Consumption (reference only)	Idle 5 mW (PS4), 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

Table 46. 512 GB M.2 2280 PCIe Gen3x4 NVMe Class 40 SSD (continued)

Features	Specifications
Environmental Non-Operating Conditions (Non-Condensing):	
Temperature Range	-40°C to 70°C
Relative Humidity Range	5% to 95%

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

Table 47. 1TB M.2 2280 PCIe Gen3x4 NVMe Class 40 Solid State Drive

Capacity (GB)	1 TB
Dimensions (W x D x H)	Approximately (22.00 in. x 80.00 in. x 2.38 in.)
Interface type and maximum speed	PCIe Gen3 32 Gb/s (Up to 4 lanes)
MTBF	1.4M hours
Logical blocks	2,000,409,264
Power source	
Power consumption (reference only)	Idle 5 mW, 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)	1500 G
Environmental Non-Operating Conditions (Non-Condensing)	
Temperature range	-40°C to 70°C
Relative humidity range	5% to 95%

512 GB Gen 4 PCIe NVMe M.2 2280 solid-state drive

Table 48. 512 GB Gen 4 PCIe NVMe M.2 2280 solid-state drive

Feature	Specifications
Capacity (GB)	512 GB
Dimensions (W x D x H)	22 x 80 x 2.38 mm
Interface type and maximum speed	PCIe Gen4 64 Gb/s (up to 4 lanes)
MTBF	1.4M hours
Logical blocks	1,000,215,216
Power source	

Table 48. 512 GB Gen 4 PCIe NVMe M.2 2280 solid-state drive (continued)

Feature	Specifications
Power consumption (reference only)	Idle 5 mW (PS4) , Active 5 W
Environmental Operating Conditions (Non-Condensing)	
Temperature range	0°C to 70°C
Relative humidity range	10% to 90%
Environmental Non-Operating Conditions (Non-Condensing)	
Temperature range	-40°C to 70°C
Relative humidity range	5% to 95%
Non-Op Shock (@ 0.5 ms)	1,500G

1 TB Gen 4 PCIe NVMe M.2 2280 solid-state drive

Table 49. 1 TB Gen 4 PCIe NVMe M.2 2280 solid-state drive

Feature	Specifications
Capacity (GB)	1 TB
Dimensions (W x D x H)	22 x 80 x 3.73 mm
Interface type and maximum speed	PCIe Gen4 64 Gb/s (up to 4 lanes)
MTBF	1.4M hours
Logical blocks	2,000,409,264
Power source	
Power consumption (reference only)	Idle 5 mW(PS4), Active 5 W
Environmental Operating Conditions (Non-Condensing)	
Temperature range	0°C to 70°C
Relative humidity range	10% to 90%
Environmental Non-Operating Conditions (Non-Condensing)	
Temperature range	-40°C to 70°C
Relative humidity range	5% to 95%
Non-Op Shock (@ 0.5 ms)	1,500G

M.2 2280 2 TB Gen 4 PCIe x4 NVMe Class 40 Solid-State Drive

Table 50. M.2 2280 2 TB Gen 4 PCIe x4 NVMe Class 40 Solid-State Drive

Feature	Specifications
Capacity (GB)	2 TB

Table 50. M.2 2280 2 TB Gen 4 PCIe x4 NVMe Class 40 Solid-State Drive (continued)

Feature	Specifications
Dimensions (W x D x H)	22 x 80 x 3.73 mm
Interface type and maximum speed	PCIe Gen4 64 Gb/s (up to 4 lanes)
MTBF	1.4M hours
Logical blocks	4,000,797,360
Power source	
Power consumption (reference only)	Idle 5 mW(PS4), Active 5 W
Environmental Operating Conditions (Non-Condensing)	
Temperature range	0°C to 70°C
Relative humidity range	10% to 90%
Environmental Non-Operating Conditions (Non-Condensing)	
Temperature range	-40°C to 70°C
Relative humidity range	5% to 95%
Non-Op Shock (@ 0.5 ms)	1,500G

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

Table 51. 256 GB M.2 2280 PCIe NVMe Class 40 Opal 2.0 SED SSD

Features	Specifications
Capacity (GB)	256 GB
Dimensions (mm) (W x D x H)	(22 x 80 x 2.38) mm
Interface type and Maximum speed	PCIe Gen3 32 Gb/s (up to 4 lanes)
Mean Time Between Failures (MTBF)	1.4M hours
Logical Blocks	500,118,192
Power Source:	
Power Consumption (reference only)	Idle 5 mW (PS4), 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 52. 512 GB M.2 2280 PCIe NVMe Class 40 Opal 2.0 SED SSD

Features	Specifications
Capacity (GB)	512 GB
Dimensions (mm) (W x D x H)	(22 x 80 x 2.38) mm
Interface type and Maximum speed	PCIe Gen3 32 Gb/s (up to 4 lanes)
Mean Time Between Failures (MTBF)	1.4M hours
Logical Blocks	1,000,215,216
Power Source:	
Power Consumption (reference only)	Idle 5 mW (PS4), 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%

M.2 2280 512 GB Gen3 PCIe NVMe Intel Optane Memory with Solid-State Drive

Table 53. M.2 2280 512 GB Gen3 PCIe NVMe Intel Optane Memory with Solid-State Drive

Features	Specifications
Capacity (GB)	512 GB 32 GB
Dimensions (mm) (W x D x H)	(22 x 80 x 2.38) mm
Interface type and Maximum speed	PCIe Gen3 32 Gb/s
Mean Time Between Failures (MTBF)	1.6 M hours
Logical Blocks	1,000,215,216
Power Source:	
Power Consumption (reference only)	Idle 10 mW, Active 4.5 W
Environmental Operating Conditions (Non-Condensing):	
Temperature Range	0°C to 70°C
Relative Humidity Range	5 to 95%
Non-Op Shock (@2 ms)	1,500G

Table 53. M.2 2280 512 GB Gen3 PCIe NVMe Intel Optane Memory with Solid-State Drive (continued)

Features	Specifications
Environmental Non-Operating Conditions (Non-Condensing):	
Temperature Range	-10°C to 85°C
Relative Humidity Range	5% to 95%

Accessories

Table 54. Accessories

Accessories
3Dconnexion SpaceMouse Wireless
Dell Premier Multi-Device Wireless Keyboard and Mouse - KM7321W
Dell Premier Rechargeable Wireless Mouse - MS7421W
Dell Mobile Adapter Speakerphone - MH3021P
Dell USB-C Mobile Adapter - DA310
Jabra Evolve2 85
Dell Thunderbolt Dock - WD19TB
Dell Notebook Power Bank Plus USB-C, 65 Wh - PW7018LC
Dell Premier Rechargeable Wireless Mouse - MS7421W
Dell Pro Hybrid Briefcase Backpack 15 - PO1521HB
Dell UltraSharp 27 4K Premier Color Monitor - UP2720Q
Dell UltraSharp 27 4K USB-C Monitor - U2720Q

Accessories

Table 55. Accessories

Accessories
Dell Premier Rechargeable Wireless Mouse - MS7421W
Dell Premier Multi-Device Wireless Keyboard and Mouse - KM7321W
Dell Mobile Adapter Speakerphone - MH3021P
Dell USB-C Mobile Adapter - DA310
Dell Pro Stereo Headset - UC350
Dell Thunderbolt Dock - WD19TB
Dell Thunderbolt Dock - WDTBS

Security

Table 56. Hardware Security

Hardware security options
TPM 2.0 FIPS 140-2 Certified, TCG Certified

Table 56. Hardware Security (continued)

Hardware security options
Optional Windows Hello compliant fingerprint reader
Optional Smartcard reader (SCR) FIPS201
Optional Contactless Smartcard reader (NFC)
Optional Contacted Smartcard and Contactless Smartcard/NFC with CV3
Nobel Wedge Lock Slot
Dell Client Command Suite: On-Prem and Cloud Dell Optimizer
Dell Power Manager Support assist: PCs and OS Recovery (Excalibur)
Dell SafeBIOS - Off-Host Verification
Dell SafeBIOS - Indicator of Attack
Dell SafeID VMware Carbon Black Endpoint: Standard, Advanced, Enterprise Absolute Visibility Absolute Control Absolute Resilience
Netskope Cloud Access
Security Broker (CASB)
Netskope Secure Web Gateway
Netskope Private Access
Optional Dell Data Security and Management Software
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
Chassis Intrusion Detection
Battery Intrusion Detection
VMware Carbon Black Endpoint + Secureworks Threat Detection and Response
Carbonite
Dell Supply Chain Defense
Mechanical privacy shutter for camera

Table 57. Data Security

Data security options
Latitude Security software per software functional plan/cycle list
D-Pedigree (Secure Supply Chain Functionality)
Dell Digital Device ID: TPM Platform Root Key provisioning

Table 57. Data Security (continued)


Data security options
BIOS complies with Dell SMBIOS implementation spec (DSIS)
SW and Drivers MUP/DUP compliant per spec Agile S01310
Dell Power Manager 3.0 or later version (DPM)
Dell Command Configure 4.0 or later (DCC) with Remote BIOS configuration
Dell Command Monitor 10.0 or later (DCM)
Dell Command Update 3.0 or later (DCU)
Dell Command Update Catalog (DCUC)
Dell Command Deploy (DCP)
Dell Command Integration Suite for System Center 5.0 (DCIS)
Dell Command Intel® vPro™ Out of Band (DCIV)
Dell Command PowerShell Provider 2.0 or later
Dell Command Deploy Driver Pack Catalog 1.0 or later

Systems management

Table 58. Systems management

Systems management
Intel® vPro™ Technology (optional, requires Intel WiFi®Link WLAN and a vPro compatible processor)
Dell Client Command Suite available (dell.com/command), Factory Installed
Factory Installed Dell Optimizer

ComfortView Plus

 **WARNING: Prolonged exposure to blue light from the display may lead to long-term effects such as eye strain, eye fatigue, or damage to the eyes.**

Blue light is a color in the light spectrum which has a short wavelength and high energy. Chronic exposure to blue light, particularly from digital sources, may disrupt sleep patterns and cause long-term effects such as eye strain, eye fatigue, or damage to the eyes.

The display on this computer is designed to minimize blue light and complies with TÜV Rheinland's requirement for low blue light displays.

Low blue light mode is enabled at the factory, so no further configuration is necessary.

To reduce the risk of eye strain, it is also recommended that you:

- Position the display at a comfortable viewing distance between 20 and 28 inches (50 and 70 cm) from your eyes.
- Blink frequently to moisten your eyes, wet your eyes with water, or apply suitable eye drops.
- Look away from your display, and gaze at a distant object at 20 ft (609.60 cm) away for at least 20 seconds during each break.
- Take an extended break for 20 minutes every two hours.

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 refers to the character that is typed out when the key is pressed. If you press shift and the key, the symbol 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 multi-media control, as indicated by the icon at the bottom of the key. Press the function key to invoke the task represented by the icon. For example, pressing F1 mutes the audio (refer to the table below).

However, if the function keys F1-F12 are needed for specific software applications, multi-media functionality can be disabled by pressing **Fn + Esc**. Subsequently, multi-media 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 59. List of keyboard shortcuts












































Function key	Redefined key (for multimedia control)	Behavior
	 + 	Mute audio
	 + 	Decrease volume
	 + 	Increase volume
	 + 	Play/Pause
	 + 	Toggle keyboard backlight (optional) NOTE: Non-backlight keyboards have F5 function key without the backlight icon and does not support toggle keyboard backlight function.
	 + 	Decrease brightness

Table 59. List of keyboard shortcuts (continued)

Function key	Redefined key (for multimedia control)	Behavior
	 + 	Increase brightness
	 + 	Switch to external display
	 + 	Print screen
	 + 	Home
	 + 	End

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


Table 60. List of keyboard shortcuts

Function key	Behavior
 + 	Pause/Break
 + 	Toggle scroll lock
 + 	System request
 + 	Open application menu
 + 	Toggle Fn-key lock

Getting help

Contacting Dell

Prerequisites

 **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.

About this task

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:

Steps

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.