Overview

HP 470 G7 Notebook PC

Left

1. Webcam LED
2. Webcam
3. Internal Microphones
4. Touchpad
5. Touchpad Button
6. Audio Combo Jack
7. USB 3.1 Gen 1 Port
8. USB 3.1 Gen 1 Port
9. HDMI Port
10. RJ-45
11. Power
12. Power Button

Overview

Right

1. Security Lock Slot
2. Optional Integrated Optical Drive
3. USB 2.0
4. SD Card Reader
5. Hard Drive LED
6. Power LED

Overview

At a Glance

- Preinstall Windows 10, Windows 10 Pro, FreeDOS
- Choice of 10th generation Intel® Core™ i7, i5 and i3 processors
- 17'? diagonal Anti-Glare high resolution display
- AMD Radeon 530 + 2 GB GDDR5 discrete graphics
- Security features including: Kensington Security Lock and TPM2.0
- Advanced Intel Wi-Fi 6[1] wireless LAN
- Weight starting at 5.2 lb (weight will vary by configuration)
- Battery life Up to 11 hours and 30 minutes[2]
- Up to 2 TB 5400 rpm SATA Drives
- Up to 512 GB M.2 Solid State Drives
- Up to 16 GB total system memory
- 720p HD camera and single digital mic
- Optional backlit keyboard, Precision touchpad with 2 buttons

1. Wireless access point and internet service required and sold separately. Availability of public wireless access points limited. Wi-Fi 6 is backwards compatible with prior 802.11 specs. The specifications for Wi-Fi 6 (802.11ax) are draft and are not final. If the final specifications differ from the draft specifications, it may affect the ability of the notebook to communicate with other 802.11ax devices.
2. Recharges the battery up to 50% within 30 minutes when the system is off or in standby mode when used with the power adapter provided with the notebook. After charging has reached 50% capacity, charging speed will return to normal. Charging time may vary +/- 10% due to System tolerance.

NOTE: See important legal disclosures for all listed specs in their respective features sections.

Technical Specifications

PRODUCT NAME

HP 470 G7 Notebook PC

OPERATING SYSTEMS

Preinstalled

Windows 10 Pro 64[1]
Windows 10 Home 64 - HP recommends Windows 10 Pro.[1]
FreeDOS

1. Not all features are available in all editions or versions of Windows. Systems may require upgraded and/or separately purchased hardware, drivers, software or BIOS update to take full advantage of Windows functionality. Windows 10 is automatically updated, which is always enabled. ISP fees may apply and additional requirements may apply over time for updates. See http://www.windows.com.

PROCESSORS

Intel® Core™ i7-10510U processor with Intel® UHD Graphics (1.8 GHz base frequency, up to 4.9 GHz with Intel® Turbo Boost Technology, 8 MB cache, 4 cores)[2,3,4,5]
Intel® Core™ i5-10210U processor with Intel® UHD Graphics (1.6 GHz base frequency, up to 4.2 GHz with Intel® Turbo Boost Technology, 6 MB cache, 4 cores)[2,3,4,5]
Intel® Core™ i3-10110U processor with Intel® UHD Graphics (2.1 GHz base frequency, up to 4.1 GHz with Intel® Turbo Boost Technology, 4 MB cache, 2 cores)[2,3,4,5]

Processors Family
10th Generation Intel® Core™ i7 processor (i7-10510U)[5]
10th Generation Intel® Core™ i5 processor (i5-10210U)[5]
10th Generation Intel® Core™ i3 processor (i3-10110U)[5]

2. Multicore is designed to improve performance of certain software products. Not all customers or software applications will necessarily benefit from use of this technology. Performance and clock frequency will vary depending on application workload and your hardware and software configurations. Intel's numbering, branding and/or naming is not a measurement of higher performance
3. Processor speed denotes maximum performance mode; processors will run at lower speeds in battery optimization mode.
4. Intel® Turbo Boost performance varies depending on hardware, software and overall system configuration. See http://www.intel.com/technology/turboboost for more information.
5. In accordance with Microsoft's support policy, HP does not support the Windows 8 or Windows 7 operating system on products configured with Intel and AMD 7th generation and forward processors or provide any Windows 8 or Windows 7 drivers on http://www.support.hp.com.

Technical Specifications

CHIPSET

Integrated with processor

GRAPHICS

Integrated
Intel® UHD graphics[6]

Discrete
AMD Radeon™ 530 (2 GB GDDR5 dedicated)

Supports
Support HD decode, DX12, HDMI 1.4b

6. HD content required to view HD images.

DISPLAYS

Internal
Non-Touch
43.9 cm (17.3") diagonal HD SVA eDP anti-glare LED-backlit, 220 nits, 45% NTSC (1600 x 900)[6,7]
43.9 cm (17.3") diagonal FHD IPS eDP anti-glare LED-backlit, 300 nits, 72% NTSC (1920 x 1080)[6,7]

Display Size
17.3"
43.9 cm (17.3")

6. HD content required to view HD images.
7. Resolutions are dependent upon monitor capability, and resolution and color depth settings.

STORAGE AND DRIVES

Primary Storage
2 TB 5400 rpm SATA[8]
1 TB 5400 rpm SATA[8]
500 GB 5400 rpm SATA[8]
128 GB SATA TLC SSD + 1 TB 5400 rpm SATA[8]
256 GB PCIe Value SSD + 1 TB 5400 rpm SATA[8]

Primary M.2 Storage
128 GB M.2 SATA-3 SSD[8]
256 GB PCIe® NVMe™ Value M.2 SSD[8]
512 GB PCIe® NVMe™ Value M.2 SSD[8]

8. For storage drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 30 GB (for Windows 10) is reserved for system recovery software.

MEMORY

Maximum Memory
16 GB DDR4-2666 SDRAM[9]

Memory
16 GB DDR4-2666 SDRAM (2 X 8 GB)[9]
8 GB DDR4-2666 SDRAM (1 x 8 GB)[9]
4 GB DDR4-2666 SDRAM (1 x 4 GB)[9]

Memory Slots
2 SODIMM
DDR4 SODIMMS, system runs at 2666
Supports Dual Channel Memory

9. Due to the non-industry standard nature of some third-party memory modules, we recommend HP branded memory to ensure compatibility. If you mix memory speeds, the system will perform at the lower memory speed.

NETWORKING/COMMUNICATIONS

WLAN
Intel® Dual Band Wireless-AC AX201 802.11a/b/g/n/ac (2x2) Wi-Fi 6 and Bluetooth® 5 Combo, non-vPro™[10]
Realtek RTL8822CE 802.11ac (2x2) Wi-Fi 5 and Bluetooth® 5 Combo[11]

Ethernet
Integrated 10/100/1000 NIC[12]

10. Wireless access point and internet service required and sold separately. Availability of public wireless access points limited. Wi-Fi is backwards compatible with prior 802.11 specs. The specifications for Wi-Fi 6 (802.11ax) are draft and are not final. If the final specifications differ from the draft specifications, it may affect the ability of the notebook to communicate with other 802.11ax devices.
11. Wireless access point and internet service required and sold separately. Availability of public wireless access points limited. Wi-Fi (802.11 ac) is backwards compatible with prior 802.11 specs.
12. The term "10/100/1000" or "Gigabit" Ethernet indicates compatibility with IEEE standard 802.3ab for Gigabit Ethernet, and does not connote actual operating speed of 1 Gb/s. For high-speed transmission, connection to a Gigabit Ethernet server and network infrastructure is required.

AUDIO/MULTIMEDIA

Audio
HP Audio Center
Dual Speakers
Single digital microphone
Camera
720p HD camera[6]

Optical Drive
DVD+/-RW Double-Layer Writer[13,14]
Support Zero-Power ODD
Support non-ODD config
Support M-disc

6. HD content required to view HD images.
13. Sold separately or as an optional feature.
14. Unit shipped with either "DVD+/-RW SuperMulti DL" or "DVD Writer Drive." Units undergoing repairs may be returned with a "DVD RW SuperMulti DL.

KEYBOARDS/POINTING DEVICES/BUTTONS & FUNCTION KEYS

Keyboard
Full Size Textured island-style Keyboard with numeric key pad
Full Size 2-coat paint island-style Backlit Keyboard with numeric key pad[15]

Pointing Device
Touchpad with multi-touch gesture support

Function Keys
ESC
F1 - help
F2 - Brightness Down
F3 - Brightness Up
F4 - Display Switching
F5 - Backlight Toggle
F6 - Audio Mute
F7 - Volume Down
F8 - Volume Up
F9 - Plays the previous track of an audio CD or the previous section of a DVD or a Blu-ray Disc (BD).
F10 - Starts, pauses, or resumes playback of an audio CD, a DVD, or a BD.
F11 - Plays the next track of an audio CD or the next section of a DVD or a BD.
F12 - airplane mode

15. Backlit keyboard is an optional feature.

SOFTWARE AND SECURITY

Software
Buy Office (Sold separately)
HP Support Assistant[16]
HP Recovery Manager
Skype
Native Miracast Support[17]

Security Management
TPM 2.0[18]
Kensington Security Lock[19]
Windows Defender[20]

16. HP Support Assistant requires Windows and Internet access.
17. Miracast is a wireless technology your PC can use to project your screen to TVs, projectors, and streaming.
18. Firmware TPM is version 2.0. Hardware TPM is v1.2, which is a subset of the TPM 2.0 specification version v0.89 as implemented by Intel Platform Trust Technology (PTT).
19. Security lock is sold separately.
20. Windows Defender Opt In, Windows 10, and internet connection required for updates.

POWER

HP Smart 65 W EM Smart AC power adapter[21]
HP Smart 65 W Smart AC power adapter[21]

Primary Battery
HP Long Life 3-cell, 41 Wh Li-ion[22,23]

Power Cord
1M length Power Cord
1M length Power Cord + Japan plug adapter

Battery life
Up to 11 hours and 30 minutes[23]

21. Availability may vary by country.
22. Battery is internal and not replaceable by customer. Serviceable by warranty.
23. Windows 10 MM14 battery life will vary depending on various factors including product model, configuration, loaded applications features, use, wireless functionality, and power management settings. The maximum capacity of the battery will naturally decrease with time and usage. See http://www.bapco.com for additional details.

WEIGHTS & DIMENSIONS

Product Weight
Starting at 5.2 lb[24]
Starting at 2.36 kg[24]

Package Weight
Starting at 6.9 lb
Starting at 3.13 Kg

Product Dimensions (w x d x h)
16.33 x 10.7 x 0.96 in
41.48 x 27.2 x 2.45 cm

24. Weight will vary by configuration.

PORTS/SLOTS

Ports
2 USB 3.1 Gen 1
1 USB 2.0
1 HDMI 1.4[25]
1 RJ-45
1 AC power
1 Headphone/microphone combo jack

Expansion Slots
support SD/SDHC/SDXC
Push-Pull Insertion/Removal

25. HDMI cable sold separately.

SERVICE AND SUPPORT

HP Services offers 1-year limited warranties and 90 day software limited warranty options depending on country. Batteries have a default one year limited warranty. Refer to http://www.hp.com/support/batterywarranty/ for additional battery information. On-site service and extended coverage is also available. HP Care Pack Services are optional extended service contracts that go beyond the standard limited warranties. To choose the right level of service for your HP product, use the HP Care Pack Services Lookup Too at: http://www.hp.com/go/cpc.[26]

26. HP Care Packs are sold separately. Service levels and response times for HP Care Packs may vary depending on your geographic location. Service starts on date of hardware purchase. Restrictions and limitations apply. For details, visit http://www.hp.com/go/cpc. HP services are governed by the applicable HP terms and conditions of service provided or indicated to Customer at the time of purchase. Customer may have additional statutory rights according to applicable local laws, and such right are not in any way affected by the HP terms and conditions of service or the HP Limited Warranty provided with your HP Product.

ENVIRONMENTAL & INDUSTRY

Eco-Label Certifications & declarations	This product has received or is in the process of being certified to the following approvals and may be labeled with one or more of these marks: • IT ECO declaration • US ENERGY STAR® • Based on US EPEAT® registration according to IEEE 1680.1-2018 EPEAT®. Status varies by country. Visit http://www.epeat.net for more information.		
System Configuration	The configuration used for the Energy Consumption and Declared Noise Emissions data for the Notebook model is based on a "Typically Configured Notebook"?.		
Energy Consumption (in accordance with US ENERGY STAR® test method)	**115VAC, 60Hz**	**230VAC, 50Hz**	**100VAC, 50Hz**
Normal Operation (Short idle)	5.81 W	6.17 W	5.99 W
Normal Operation (Long idle)	3.58 W	3.50 W	3.62 W
Sleep	0.30 W	0.29 W	0.29 W
Off	0.19 W	0.20 W	0.19 W
	Energy efficiency data listed is for an ENERGY STAR® compliant product if offered within the model family. HP computers marked with the ENERGY STAR® Logo are compliant with the applicable U.S. Environmental Protection Agency (EPA) ENERGY STAR® specifications for computers. If a model family does not offer ENERGY STAR® compliant configurations, then energy efficiency data listed is for a typically configured PC featuring a hard disk drive, a high efficiency power supply, and a Microsoft Windows® operating system.		
Heat Dissipation*	**115VAC, 60Hz**	**230VAC, 50Hz**	**100VAC, 50Hz**
Normal Operation (Short idle)	20 BTU/hr	21 BTU/hr	20 BTU/hr
Normal Operation (Long idle)	12 BTU/hr	12 BTU/hr	12 BTU/hr
Sleep	1 BTU/hr	1 BTU/hr	1 BTU/hr
Off	1 BTU/hr	1 BTU/hr	1 BTU/hr
	Heat dissipation is calculated based on the measured watts, assuming the service level is attained for one hour.		
Declared Noise Emissions (in accordance with ISO 7779 and ISO 9296)	Sound Power (L_{WAd}, bels)	Sound Pressure (L_{pAm}, decibels)	
Typically Configured - Idle	2.8	25	

Technical Specifications

Fixed Disk - Random writes	2.8	26
Longevity and Upgrading	This product can be upgraded, possibly extending its useful life by several years. Upgradeable features and/or components contained in the product may include: 3 USB ports 1 PC card slot (type I/II) 1 ExpressCard/54 slot 1 IEEE 1394 Port 2 SODIMM memory slots Optional expansion base docking station 1 multi-bay II storage port Interchangeable HDD Spare parts are available throughout the warranty period and or for up to "5"? years after the end of production.	
Batteries	This battery(s) in this product comply with EU Directive 2006/66/EC Batteries used in the product do not contain: Mercury greater the1ppm by weight Cadmium greater than 20ppm by weight Battery size: Not Applilcable Battery type: Not Applilcable	
Additional Information	This product is in compliance with the Restrictions of Hazardous Substances (RoHS) directive - 2011/65/EC. This HP product is designed to comply with the Waste Electrical and Electronic Equipment (WEEE) Directive - 2002/96/EC. This product is in compliance with California Proposition 65 (State of California; Safe Drinking Water and Toxic Enforcement Act of 1986). This product is in compliance with the IEEE 1680.1 (EPEAT) standard at the <Silver> level, see http://www.epeat.net Plastics parts weighing over 25 grams used in the product are marked per ISO11469 and ISO1043. This product contains 2.3% post-consumer recycled plastic (by wt.) This product is 95.5% recycle-able when properly disposed of at end of life.	

Packaging Materials	**External:**	PAPER/Paperboard	42 g
		PAPER/Corrugated	274 g
	Internal:	PLASTIC/Polypropylene - PP	5 g
		PLASTIC/Polyethylene Expanded - EPE	64 g

Technical Specifications

		PLASTIC/Polyethylene low density - LDPE	14 g
Material Usage	This product does not contain any of the following substances in excess of regulatory limits (refer to the HP General Specification for the Environment at http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/gse.pdf): Asbestos Certain Azo Colorants Certain Brominated Flame Retardants - may not be used as flame retardants in plastics Cadmium Chlorinated Hydrocarbons Chlorinated Paraffins Formaldehyde Halogenated Diphenyl Methanes Lead carbonates and sulfates Lead and Lead compounds Mercuric Oxide Batteries Nickel - finishes must not be used on the external surface designed to be frequently handled or carried by the user. Ozone Depleting Substances Polybrominated Biphenyls (PBBs) Polybrominated Biphenyl Ethers (PBBEs) Polybrominated Biphenyl Oxides (PBBOs) Polychlorinated Biphenyl (PCB) Polychlorinated Terphenyls (PCT) Polyvinyl Chloride (PVC) - except for wires and cables, and certain retail packaging has been voluntarily removed from most applications. Radioactive Substances Tributyl Tin (TBT), Triphenyl Tin (TPT), Tributyl Tin Oxide (TBTO)		
Packaging Usage	HP follows these guidelines to decrease the environmental impact of product packaging: Eliminate the use of heavy metals such as lead, chromium, mercury and cadmium in packaging materials. Eliminate the use of ozone-depleting substances (ODS) in packaging materials. Design packaging materials for ease of disassembly. Maximize the use of post-consumer recycled content materials in packaging materials. Use readily recyclable packaging materials such as paper and corrugated materials. Reduce size and weight of packages to improve transportation fuel efficiency. Plastic packaging materials are marked according to ISO 11469 and DIN 6120 standards.		
End-of-life Management and	HP Inc. offers end-of-life HP product return and recycling programs in many geographic areas. To recycle your product, please go to: http://www.hp.com/go/reuse-recycle or contact your nearest HP sales office.		

Technical Specifications

Recycling	Products returned to HP will be recycled, recovered or disposed of in a responsible manner. The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard web site at: http://www.hp.com/go/recyclers. These instructions may be used by recyclers and other WEEE treatment facilities as well as HP OEM customers who integrate and re-sell HP equipment.
HP Inc. Corporate Environmental Information	For more information about HP's commitment to the environment: Global Citizenship Report http://www.hp.com/hpinfo/globalcitizenship/gcreport/index.html Eco-label certifications http://www8.hp.com/us/en/hp-information/environment/ecolabels.html ISO 14001 certificates: http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/PC_GBU_Product_Design_ISO_14K_Certificate.pdf and http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/cert.pdf

COMPATIBILITY

HP USB-C/A Universal Dock G2	5TW13AA
HP USB Essential Keyboard and Mouse	H6L29AA
HP Essential Messenger Case (up to 17.3")	H1D25AA
HP Keyed Cable Lock 10mm	T1A62AA

CERTIFICATION AND COMPLIANCE

ENERGY STAR® certified
EPEAT® 2019 Silver[27]

27. Based on US EPEAT® registration according to IEEE 1680.1-2018 EPEAT®. Status varies by country. Visit http://www.epeat.net f more information.

FACETS

Maximum Resolution	1920 x 1080
Screen Size, imperial	17.3 (diagonal)
Weight, Metric	2.36
Weight, Imperial	5.2

SYSTEM UNIT

Technical Specifications

Stand-Alone Power Requirements (AC Power)	
Nominal Operating Voltage	19V
Average Operating Power	Win 10
Integrated graphics	6.05 W
Max Operating Power	Discrete < 65 W UMA
Temperature	
Operating	32° to 95° F (0° to 35° C) (Not writing optical) 41° to 95° F (5° to 35° C) (Writing optical)
Non-operating	-4° to 140° F (-20° to 60° C)
Relative Humidity	
Operating	10% to 90%, non-condensing
Non-operating	5% to 95%
Shock	
Operating	40 G, 2 ms duration, half-sine
Non-operating	240 G, 2 ms duration, half-sine
Random Vibration	
Operating	1.043 grms
Non-operating	3.5 grms
Altitude (unpressurized)	
Operating	-15 m to 3048 m (-50 ft to 10000 ft)
Non-operating	-15 m to 12192 m (-50 ft to 40000 ft)
Planned Industry Standard Certifications	
UL	Yes
CSA	No
FCC Compliance	Yes
ENERGY STAR®	Selected models[28]
EPEAT®	EPEAT® 2019 Silver in U.S.[29]
ICES	Yes
Australia	No
NZ A-Tick Compliance	No
CCC	No
Japan VCCI Compliance	No
KC	No
BSMI	No
CE Marking Compliance	Yes
BNCI or BELUS	Yes
CIT	Yes
GOST	Yes
Saudi Arabian Compliance (ICCP)	Yes
SABS	Yes
UKRSERTCOMPUTER	No

28. Configurations of the HP ProBook 430 G7 that are ENERGY STAR® certified[2] are identified as HP ProBook 430 G7 ENERGY STAR on HP websites and on http://www.energystar.gov.

29. Based on US EPEAT® registration according to IEEE 1680.1-2018 EPEAT®. Status varies by country. Visit http://www.epeat.net for more information.

DISPLAYS

Note: All specifications represent the typical specifications provided by HP's component manufacturers; actual performance may vary either higher or lower.

17.3 FHD AG WLED UWVA 72% cg 300 nits flat LED backlight (1920 x 1080)	**Outline Dimensions (W x H x D)**	399.95 x 251.01 mm max. (Including PCB & bracket)
	Active Area	381.888 x 214.812
	Weight	550 max.
	Diagonal Size	17.3"
	Thickness	Flat 4.0 mm max
	Interface	eDP1.3 w/o PSR
	Surface Treatment	Anti-glare (AG)
	Touch Enabled	No
	Contrast Ratio	600:1 (typ)
	Refresh Rate	60 Hz
	Brightness	300 nit typ
	Pixel Resolution	1920 x 1080 (FHD)
	Backlight	LED
	Format of LCD Pixel Arrangement	RGB
	Color Gamut Coverage	72%
	Color Depth	6 bits+Hi-FRC
	Viewing Angle	UWVA 85/85/85/85
17.3 HD+ AG WLED SVA 60% cg 220 nits flat LED backlight (1600 x 900)	**Outline Dimensions (W x H x D)**	398.6 x 251 (max.)
	Active Area	382.08 x 214.92 (mm)
	Weight	550 g max.
	Diagonal Size	17.3 (inch)
	Thickness	4.0 mm max
	Interface	eDP1.3 w/o PSR
	Surface Treatment	Anti-glare (AG)
	Touch Enabled	No
	Contrast Ratio	300:1 (typ)
	Refresh Rate	60 Hz
	Brightness	220 nit typ
	Pixel Resolution	1600 x 900 (HD+)
	Backlight	LED
	Format of LCD Pixel Arrangement	RGB
	Color Gamut Coverage	60%
	Color Depth	6 bits+Hi-FRC
	Viewing Angle	SVA 40/40/15/30

STORAGE AND DRIVES

Technical Specifications

500 GB 5400 rpm SATA Hard Drive	**Drive Weight**	0.21 lbs (95 g)
	Rotation speed	5400 rpm
	Cache Buffer	Up to 128 MB
	Height	0.28 in (7 mm)
	Width	2.75 in (69.85 mm)
	Interface	ATA-8, SATA 3.0
	Transfer Rate	600 MB/s
	Seek Time	Single Track: 2ms; Average: 12 ~ 13 ms; Maximum: 18 ~ 22 ms
	Logical Blocks	976,773,168
	Operating Temperature	32° to 140° F (0° to 60° C) [case temp]
	Security Features	ATA Security
	Features	S.M.A.R.T., NCQ, Ultra DMA
1 TB 5400 rpm SATA Hard Drive	**Drive Weight**	0.21 lbs (95 g)
	Rotation speed	5400 rpm
	Cache Buffer	Up to 128 MB
	NAND Type/Size	0.28 in (7 mm)
	Height	2.75 in (69.85 mm)
	Width	ATA-8, SATA 3.0
	Interface	600 MB/s
	Transfer Rate	Single Track: 2ms Average: 12 ~ 13 ms Maximum: 18 ~ 22 ms
	Seek Time	1,953,525,168
	Logical Blocks	32° to 140° F (0° to 60° C) [case temp]
	Operating Temperature	ATA Security
	Security Features	S.M.A.R.T., NCQ, Ultra DMA
2 TB 5400 rpm SATA Hard Drive	**Drive Weight**	117 g Max
	Rotation speed	5400 rpm
	Cache Buffer	Up to 128 MB
	Height	0.374 in (9.5 mm) Max
	Width	2.75 in (69.85 mm)
	Interface	ATA-8, SATA 3.0
	Transfer Rate	600 MB/s
	Seek Time	Single Track: 2ms Average: 12 ~ 13 ms Maximum: 18 ~ 22 ms
	Logical Blocks	3,907,029,168
	Operating Temperature	32° to 140° F (0° to 60° C) [case temp]
	Security Features	ATA Security
	Features	S.M.A.R.T., NCQ, Ultra DMA

Technical Specifications

256 GB 2280 M2 PCIe NVMe Value Solid State Drive	**Form Factor**	M.2 2280
	Capacity	256 GB
	NAND Type	TLC
	Height	0.09 in (2.3 mm)
	Width	0.87 in (22 mm)
	Interface	PCIe NVMe Gen3x2
	Maximum Sequential Read	Up to 1500 MB/s
	Maximum Sequential Write	Up to 1000 MB/s
	Logical Blocks	500,118,192
	Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]
	Features	TRIM, L1.2
512 GB 2280 M2 PCIe NVMe Value Solid State Drive	**Form Factor**	M.2 2280
	Capacity	512GB
	NAND Type	TLC
	Height	0.09 in (2.3 mm)
	Width	0.87 in (22 mm)
	Interface	PCIe NVMe Gen3x4
	Maximum Sequential Read	Up to 1500 MB/s
	Maximum Sequential Write	Up to 1000 MB/s
	Logical Blocks	1,000,215,215
	Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]
	Features	DIPM; TRIM; DEVSLP
128 GB 2280 M2 SATA-3 TLC Solid State Drive	**Form Factor**	M.2 2280
	Capacity	128 GB
	NAND Type	TLC
	Height	0.09 in (2.3 mm)
	Width	0.87 in (22 mm)
	Interface	ATA-8, SATA 3.0
	Maximum Sequential Read	Up To 500 MB/s
	Maximum Sequential Write	Up To 500 MB/s
	Logical Blocks	250,069,680
	Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]
	Features	DIPM; TRIM; DEVSLP

Technical Specifications

NETWORKING/COMMUNICATIONS

Realtek RTL8822CE 802.11ac (2 x 2) Wi-Fi® and Bluetooth® 5[1]	**Wireless LAN Standards**	IEEE 802.11a IEEE 802.11b IEEE 802.11g IEEE 802.11n IEEE 802.11ac IEEE 802.11d IEEE 802.11e IEEE 802.11h IEEE 802.11i IEEE 802.11k IEEE 802.11r IEEE 802.11v
	Interoperability	Wi-Fi® certified
	Frequency Band	• 802.11b/g/n 2.402 - 2.482 GHz • 802.11a/n/ac 4.9 - 4.95 GHz (Japan) 5.15 - 5.25 GHz 5.25 - 5.35 GHz 5.47 - 5.725 GHz 5.825 - 5.850 GHz
	Data Rates	• 802.11b: 1, 2, 5.5, 11 Mbps • 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps • 802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps • 802.11n: MCS 0 ~ MCS 15, (20MHz, and 40MHz) • 802.11ac: MCS0 ~ MCS9, (1SS, and 2SS) (20MHz, 40MHz & 80MHz)
	Modulation	Direct Sequence Spread Spectrum BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM
	Security[3]	• IEEE compliant 64 / 128 bit WEP encryption for a/b/g mode only • AES-CCMP: 128 bit in hardware • 802.1x authentication • WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES. • WPA2 certification • IEEE 802.11i • WAPI
	Network Architecture Models	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)
	Roaming	IEEE 802.11 compliant roaming between access points
	Output Power[2]	• 802.11b: +18.5dBm minimum • 802.11g: +17.5dBm minimum • 802.11a: +18.5dBm minimum • 802.11n HT20(2.4GHz): +15.5dBm minimum • 802.11n HT40(2.4GHz): +14.5dBm minimum • 802.11n HT20(5GHz): +15.5dBm minimum • 802.11n HT40(5GHz): +14.5dBm minimum • 802.11ac VHT80(5GHz): +11.5dBm minimum • 802.11ac VHT160(5GHz): +11.5dBm minimum
	Power Consumption	• Transmit mode: 2.0 W • Receive mode:1.6 W • Idle mode (PSP) 180 mW (WLAN Associated) • Idle mode: 50 mW (WLAN unassociated)

- Connected Standby/Modern Standby: 10mW
- Radio disabled: 8 mW

Power Management	ACPI and PCI Express compliant power management 802.11 compliant power saving mode
Receiver Sensitivity[4]	802.11b, 1Mbps: -93.5dBm maximum 802.11b, 11Mbps: -84dBm maximum 802.11a/g, 6Mbps: -86dBm maximum 802.11a/g, 54Mbps: -72dBm maximum 802.11n, MCS07: -67dBm maximum 802.11n, MCS15: -64dBm maximum 802.11ac, MCS0: -84dBm maximum 802.11ac, MCS9: -59dBm maximum
Antenna type	High efficiency antenna with spatial diversity, mounted in the display enclosure Two embedded dual band 2.4/5 GHz antennas are provided to the card to support WLAN MIMO communications and Bluetooth communications
Form Factor	PCI-Express M.2 MiniCard with CNVi Interface
Dimensions	1. Type 2230: 2.3 x 22.0 x 30.0 mm 2. Type 1216: 1.67 x 12.0 x 16.0 mm
Weight	1. Type 2230: 2.8 g 2. Type 126: 1.3 g
Operating Voltage	3.3v +/- 9%
Temperature	**Operating** 14° to 158° F (-10° to 70° C) **Non-operating** -40° to 176° F (-40° to 80° C)
Humidity	**Operating** 10% to 90% (non-condensing) **Non-operating** 5% to 95% (non-condensing)
Altitude	**Operating** 0 to 10,000 ft (3,048 m) **Non-operating** 0 to 50,000 ft (15,240 m)
LED Activity	LED Amber - Radio OFF LED OFF - Radio ON

HP Integrated Module with Bluetooth 4.0/4.1/4.2/5.0 Wireless Technology

Bluetooth Specification	4.0/4.1/4.2/5.0 Compliant
Frequency Band	2402 to 2480 MHz
Number of Available Channels	Legacy: 0~79 (1 MHz/CH) BLE: 0~39 (2 MHz/CH)
Signaling Data Rate	Legacy: 3 Mbps signaling data rate[1] 2.17 Mbps BLE: 1 Mbps signaling data rate[1] 0.2 Mbps 1. Actual throughput may vary. Legacy: Synchronous Connection Oriented links up to 3, 64 kbps, voice channels Legacy: Asynchronous Connection Less links 2178.1 kbps/177.1 kbps asymmetric (3-DH5) or 864 kbps symmetric (3-EV5)
Transmit Power	The Bluetooth component shall operate as a Class II Bluetooth device with a maximum transmit power of + 4 dBm for BR and EDR.
Power Consumption	Peak (Tx) 330 mW Peak (Rx) 230 mW Selective Suspend 17 mW
Bluetooth Software Supported	Microsoft Windows Bluetooth Software
Power Management	Microsoft Windows ACPI, and USB Bus Support
Certifications	FCC (47 CFR) Part 15C, Section 15.247 & 15.249

Technical Specifications

	Power Management	ETS 300 328, ETS 300 826
	Certifications	Low Voltage Directive IEC950 UL, CSA, and CE Mark
	Bluetooth Profiles Supported	BT4.1-ESR 5/6/7 Compliance LE Link Layer Ping LE Dual Mode LE Link Layer LE Low Duty Cycle Directed Advertising LE L2CAP Connection Oriented Channels Train Nudging & Interlaced Scan BT4.2 ESR08 Compliance LE Secure Connection- Basic/Full LE Privacy 1.2 -Link Layer Privacy LE Privacy 1.2 -Extended Scanner Filter Policies LE Data Packet Length Extension FAX Profile (FAX) Basic Imaging Profile (BIP)2 Headset Profile (HSP) Hands Free Profile (HFP) Advanced Audio Distribution Profile (A2DP)

1. Wireless access point and Internet service is required. Availability of public wireless access point is limited.
2. The FCC has declared as of September 1, 2014 products that utilize passive scanning on channel 12/13 and are capable of transmitting must fully comply with requirements of 15.247 or otherwise disable those channels.
3. Check latest software/driver release for updates on supported security features.
4. Receiver sensitivity is measured at a packet error rate of 8% for 802.11b (CKK modulation) and a packet error rate of 10% for 802.11a/g (OFDM modulation).

Intel Wi-Fi 6[5] AX201 and Bluetooth ® 5.0 (802.11ax 2x2, non-vPro, supporting gigabit file transfer speeds) non-vPro	**Wireless LAN Standards**	IEEE 802.11a IEEE 802.11b IEEE 802.11g IEEE 802.11n IEEE 802.11ac IEEE 802.11ax IEEE 802.11d IEEE 802.11e IEEE 802.11h IEEE 802.11i IEEE 802.11k IEEE 802.11r IEEE 802.11v
	Interoperability	Wi-Fi modules
	Frequency Band	• 802.11b/g/n/ax 2.402 - 2.482 GHz • 802.11a/n/ac/ax 4.9 - 4.95 GHz (Japan) 5.15 - 5.25 GHz 5.25 - 5.35 GHz 5.47 - 5.725 GHz 5.825 - 5.850 GHz
	Data Rates	• 802.11b: 1, 2, 5.5, 11 Mbps • 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps • 802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps • 802.11n: MCS 0 ~ MCS 15, (20MHz, and 40MHz) • 802.11ac: MCS0 ~ MCS9, (1SS, and 2SS) (20MHz,

	40MHz, 80MHz & 160MHz) • 802.11ax: MCS0 ~ MCS11, (1SS and 2SS) (20MHz, 40MHz, 80MHz & 160MHz)
Modulation	Direct Sequence Spread Spectrum OFDM, BPSK, QPSK, CCK,16-QAM, 64-QAM, 256-QAM,1024QAM
Security[3]	• IEEE compliant 64 / 128 bit WEP encryption for a/b/g mode only • AES-CCMP: 128 bit in hardware • 802.1x authentication • WPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES. • WPA2 certification • IEEE 802.11i • WAPI
Network Architecture	Ad-hoc (Peer to Peer)
Models	Infrastructure (Access Point Required)
Roaming	IEEE 802.11 compliant roaming between access points
Output Power[2]	• 802.11b: +18.5dBm minimum • 802.11g: +17.5dBm minimum • 802.11a: +18.5dBm minimum • 802.11n HT20(2.4GHz): +15.5dBm minimum • 802.11n HT40(2.4GHz): +14.5dBm minimum • 802.11n HT20(5GHz): +15.5dBm minimum • 802.11n HT40(5GHz): +14.5dBm minimum • 802.11ac VHT80(5GHz): +11.5dBm minimum • 802.11ac VHT160(5GHz): +11.5dBm minimum • 802.11ax HT40(2.4GHz): +10dBm minimum • 802.11ax VHT160(5GHz): +10dBm minimum
Power Consumption	• Transmit mode 2.0 W • Receive mode 1.6 W • Idle mode (PSP) 180 mW (WLAN Associated) • Idle mode 50 mW (WLAN unassociated) • Connected Standby 10mW • Radio disabled 8 mW
Power Management	ACPI compliant power management 802.11 compliant power saving mode
Receiver Sensitivity[4]	• 802.11b, 1Mbps: -93.5dBm maximum • 802.11b, 11Mbps: -84dBm maximum • 802.11a/g, 6Mbps: -86dBm maximum • 802.11a/g, 54Mbps: -72dBm maximum • 802.11n, MCS07: -67dBm maximum • 802.11n, MCS15: -64dBm maximum • 802.11ac, MCS0: -84dBm maximum • 802.11ac, MCS9: -59dBm maximum • 802.11ax, MCS11(HT40): -59dBm maximum • 802.11ax, MCS11(VHT160): -58.5dBm maximum
Antenna type	High efficiency antenna with spatial diversity, mounted in the display enclosure Two embedded dual band 2.4/5 GHz antennas are provided to the card to support WLAN MIMO communications and Bluetooth communications
Form Factor	PCI-Express M.2 MiniCard with CNVi Interface
Dimensions	1. Type 2230: 2.3 x 22.0 x 30.0 mm 2. Type 1216: 1.67 x 12.0 x 16.0 mm
Weight	1. Type 2230: 2.8 g 2. Type 126: 1.3 g

Technical Specifications

Operating Voltage	3.3v +/- 9%	
Temperature	**Operating**	14° to 158° F (-10° to 70° C)
	Non-operating	-40° to 176° F (-40° to 80° C)
Humidity	**Operating**	10% to 90% (non-condensing)
	Non-operating	5% to 95% (non-condensing)
Altitude	**Operating**	0 to 10,000 ft (3,048 m)
	Non-operating	0 to 50,000 ft (15,240 m)
LED Activity	LED Amber - Radio OFF LED Off - Radio ON	

HP Integrated Module with Bluetooth 4.0/4.1/4.2/5.0/5.1 Wireless Technology

Bluetooth Specification	4.0/4.1/4.2/5.0/5.1 Compliant
Frequency Band	2402 to 2480 MHz
Number of Available Channels	Legacy: 0~79 (1 MHz/CH) BLE: 0~39 (2 MHz/CH)
Signaling Data Rate	Legacy: 3 Mbps signaling data rate[1] 2.17 Mbps BLE: 1 Mbps signaling data rate[1] 0.2 Mbps 1. Actual throughput may vary. Legacy: Synchronous Connection Oriented links up to 3, 64 kbps, voice channels Legacy: Asynchronous Connection Less links 2178.1 kbps/177.1 kbps asymmetric (3-DH5) or 864 kbps symmetric (3-EV5)
Transmit Power	The Bluetooth component shall operate as a Class II Bluetooth device with a maximum transmit power of + 4 dBm for BR and EDR.
Power Consumption	Peak (Tx) 330 mW Peak (Rx) 230 mW Selective Suspend 17 mW
Bluetooth Software Supported	Microsoft Windows Bluetooth Software
Power Management	Microsoft Windows ACPI, and USB Bus Support
Certifications	FCC (47 CFR) Part 15C, Section 15.247 & 15.249
Power Management Certifications	ETS 300 328, ETS 300 826 Low Voltage Directive IEC950 UL, CSA, and CE Mark
Bluetooth Profiles Supported	BT4.1-ESR 5/6/7 Compliance LE Link Layer Ping LE Dual Mode LE Link Layer LE Low Duty Cycle Directed Advertising LE L2CAP Connection Oriented Channels Train Nudging & Interlaced Scan BT4.2 ESR08 Compliance LE Secure Connection- Basic/Full LE Privacy 1.2 -Link Layer Privacy LE Privacy 1.2 -Extended Scanner Filter Policies LE Data Packet Length Extension FAX Profile (FAX) Basic Imaging Profile (BIP)2 Headset Profile (HSP) Hands Free Profile (HFP) Advanced Audio Distribution Profile (A2DP)

1. Wireless access point and Internet service is required. Availability of public wireless access point is limited. The specifications for the 802.11ac WLAN are draft specifications and are not final. If the final specifications differ from the draft specifications, it may affect the ability of the notebook to communicate with other 802.11ac WLAN devices

Technical Specifications

2. The FCC has declared as of September 1, 2014 products that utilize passive scanning on channel 12/13 and are capable of transmitting must fully comply with requirements of 15.247 or otherwise disable those channels.
3. Check latest software/driver release for updates on supported security features.
4. Receiver sensitivity is measured at a packet error rate of 8% for 802.11b (CKK modulation) and a packet error rate of 10% for 802.11a/g (OFDM modulation).
5. Wireless access point and internet service required and sold separately. Availability of public wireless access points limited. Wi-Fi 6 is backwards compatible with prior 802.11 specs. The specifications for Wi-Fi 6 (802.11ax) are draft and are not final. If the final specifications differ from the draft specifications, it may affect the ability of the notebook to communicate with other 802.11ax devices. Only available in countries where 802.11ax is supported.

POWER

HP 65 W Smart AC adapter	**Dimensions (H x W x D)**	90.0 x 51 x 28.5 mm	
	Weight	230g +/- 10g Not including power cord. Power cord varies by country.	
	Input	100 to 240 VAC	
		Input Efficiency	87.74 % at 115 Vac and 88.4 % at 230 Vac
		Input frequency range	48 to 63 Hz
		Input AC current	1.7 A at 90 V
	Output	**Output power**	65 W
		DC output	19.5 V
		Hold-up time	5 msec at 115 V input
		Output current limit	<11.0A
	Connector	4.5mm barrel type	
	Environmental Design	**Operating temperature**	32°F to 95°F (0°C to 35°C)
		Non-operating (storage) temperature	-4°F to 185°F (-20°C to 85°C)
		Altitude	0 to 16,400 ft (0 to 5000 m)
		Humidity	20% to 95%
		Storage Humidity	10% to 95%
	EMI and Safety Certifications	CE Mark - full compliance with LVD and EMC directives Worldwide safety standards - IEC60950, EN60950, UL60950, Class1, SELV; Agency approvals - C-UL-US, NORDICS, DENAN, EN55022 Class B, FCC Class B, CISPR22 Class B, CCC, NOM-1 NYCE. MTBF - over 200,000 hours at 25°C ambient condition.	

Technical Specifications

HP 65 W EM Smart AC adapter	**Dimensions**	102 x 55 x 30 mm	
	Weight	250 g +/- 10 g Not including power cord. Power cord varies by country.	
	Input	100 to 240 VAC	
		Input Efficiency	87.74 % at 115 Vac and 88.4 % at 230Vac
		Input frequency range	48 ~ 63 Hz
		Input AC current	Max. 1.7 A at 90 Vac
	Output	**Output power**	65 W
		DC output	19.5 V
		Hold-up time	5 ms at 115 VAC input
		Output current limit	<11.0 A
	Connector	4.5mm barrel type	
	Environmental Design	**Operating temperature**	32°F to 95°F (0° to 35°C)
		Non-operating (storage) temperature	-4°F to 185°F (-20° to 85°C)
		Altitude	0 to 16,400 ft (0 to 5000m)
		Humidity	20% to 95%
		Storage Humidity	10% to 95%
	EMI and Safety Certifications	CE Mark - full compliance with LVD and EMC directives Worldwide safety standards - IEC60950, EN60950, UL60950, Class1, SELV; Agency approvals - C-UL-US, NORDICS, DENAN, EN55022 Class B, FCC Class B, CISPR22 Class B, CCC, NOM-1 NYCE. MTBF - over 200,000 hours at 25°C ambient condition.	

HP 3-cell Long Life Li-Ion (41 WHr)	**Dimensions**	6.0 x 186.35 x 90.2 mm (0.236 x 7.33 x 3.55 inch)
	Weight	0.19 kg (0.418 lb)
	Cells/Type	3cell Lithium-Ion Polymer cell / 515974 Prismatic cell 496080
	Voltage	11.55 V / 11.4 V / 11.34 V
	Amp-hour capacity	3.63 Ah / 3.6 Ah / 3.62 Ah
	Watt-hour capacity	41 Wh
	Operating (Charging)	32° to 113° F (0° to 45°C)
	Operating (Discharging)	14° to 122° F (-10° to 60°C)
	Warranty	1-year
	Optional Travel Battery Available	No

1. Recharges the battery up to 50% within 30 minutes when the system is off or in standby mode when used with the power adapter provided with the notebook. After charging has reached 50% capacity, charging speed will return to normal. Charging time may vary +/- 10% due to System tolerance.

Country of Origin

China

Options and Accessories (sold separately and availability may vary by country)

Type	Description	Part Number
Cases	HP Essential Messenger Case (up to 17.3")	H1D25AA
	HP Business Backpack (up to 17.3")	2SC67AA
	HP Business Slim Top Load (up to 17.3")	2UW02AA
Input/Output	HP USB Essential Keyboard and Mouse	H6L29AA
	HP Ultra Mobile Wireless Mouse	H6F25AA
	HP Comfort Grip Wireless Mouse	H2L63AA
	HP 3-Button USB Laser Mouse	H4B81AA
	HP USB Travel Mouse	G1K28AA
Power	HP 65W Smart Power Adapter	H6Y89AA
	HP 65W Slim AC Adapter	H6Y82AA
Security	HP Keyed Cable Lock 10mm	T1A62AA
	HP Sure Key Cable Lock	6UW42AA

Summary of Changes

Date of change:	Version History:		Description of change:
December 4, 2019	V1 to V2	Added	Battery Life
December 13, 2019	V2 to V3	Added	Environmental Section