Overview

HP ProBook 470 G5 Notebook PC

Front

1. Microphones (2)
2. Webcam
3. Webcam light
4. Fingerprint reader
5. Clickpad
6. Hard drive LED
7. SD Card reader

8. Headphone/microphone combo jack
9. USB 2.0 (power port)
10. Power button
11. Security lock slot (Lock sold separately.)

Not all configuration components are available in all regions/countries.
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Overview

Rear

1.	Power connector	4.	HDMI port (Cable not included.)
2.	Ethernet port (RJ-R45)	5.	USB 3.1 Gen 1 (2)
3.	External VGA monitor port	6.	USB Type-C™ port

Not all configuration components are available in all regions/countries.
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Overview

At a Glance

1. Preinstalled with Windows 10 versions or FreeDOS 2.0

2. Choice of Intel® Core™ processors

3. HP Premium Keyboard, full-sized, spill resistant with numeric keypad and optional backlit

4. Function keys provide control of features including: standby mode, display brightness, external display, microphone mute, volume down, volume up, and backlight toggle for backlit keyboard (Select models only.)

5. Large Clickpad with gestures support

6. Enhanced security features with preinstalled software and hardware options

7. Optional HD webcam with dual-microphone array for video conferencing [1]

8. HDMI port for connecting to high-resolution displays

9. Choice of displays

   o 43.9 cm (17.3") diagonal FHD UWVA anti-glare LED-backlit non-touch; 220 cd/m²; 45% sRGB (1920 x 1080)

   o 43.9 cm (17.3") diagonal HD+ anti-glare LED-backlit non-touch; 220 cd/m²; 45% sRGB (1600 x 900)

10. Flexible wireless connectivity options

11. Battery life up to 14 hours 15 mins (i3, HD with SSD)

12. HP 3-cell, 48 WHr Li-ion battery

13. Passed MIL-STD testing [2]

1. Sold separately or as an optional feature.
2. MIL-STD-810G testing is not intended to demonstrate fitness of U.S. Department of Defense (DoD) contract requirements or for military use. Test results are not a guarantee of future performance under these test conditions. Accidental damage requires an optional HP Accidental Damage Protection Care Pack.

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

Features

PRODUCT NAMES

HP ProBook 470 G5 Notebook PC

OPERATING SYSTEMS

Preinstalled

Windows 10 Pro 64 – HP recommends Windows 10 Pro [1]
Windows 10 Pro 64 (National Academic License) [1,2]
Windows 10 Home 64 [1]
Windows 10 Home Single Language 64 [1]
Windows 10 Home 64 (National Academic License) [1,2]
FreeDOS 2.0

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/.
2. **Note:** Some devices for academic use will automatically be updated to Windows 10 Pro Education with the Windows 10 Anniversary Update. Features vary; see https://aka.ms/ProEducation for Windows 10 Pro Education feature information.

PROCESSORS

Intel® Core™ i7-8550U Intel® UHD graphics 620 (1.8 GHz, up to 4.0 GHz with Intel® Turbo Boost Technology 2.0, 8 MB cache, 4 cores) [3,4,5]
Intel® Core™ i7-7500U with Intel® HD Graphics 620 (2.7 GHz, up to 3.5 GHz with Intel® Turbo Boost Technology, 4 MB cache, 2 cores) [3,4,5]
Intel® Core™ i5-8250U Intel® UHD Graphics 620 (1.6 GHz, up to 3.4 GHz with Intel® Turbo Boost Technology 2.0, 6 MB cache, 4 cores) [3,4,5]
Intel® Core™ i3-8130U with Intel® HD Graphics 620 (2.2GHz/3.4GHz Dual Core Turbo, 4MB L3 Cache 15W)
Intel® Core™ i3-7100U with Intel® HD Graphics 620 (2.4 GHz, 3 MB cache, 2 cores) [3,4,5]

Processors Family
8th Generation Intel® Core™ i7 processor (i7-8550U model) [5]
8th Generation Intel® Core™ i5 processor (i5-8250U model) [5]
8th Generation Intel® Core i3 processor (Intel® Core™ i3-8130U model)
7th Generation Intel® Core™ i7 processor (i7-7500U model)
7th Generation Intel® Core™ i3 processor (i3-7100U model) [5]

3. 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 is not a measurement of higher performance.
4. Processor speed denotes maximum performance mode; processors will run at lower speeds in battery optimization mode.
5. **NOTE:** 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.

Features

CHIPSET

Integrated with processor

GRAPHICS

Integrated
Intel® UHD graphics 620 [6]
Intel® HD graphics 620 [6]

NOTE: View processor section for details.

Discrete
NVIDIA® GeForce® 930MX (2 GB DDR3 dedicated, switchable) [7]

Supports
Support HD decode, DX12, HDMI 1.4b

6. HD content required to view HD images.
7. NVIDIA® technology requires an Intel® processor, plus an NVIDIA® GeForce® discrete graphics configuration and is available on Windows 10 Professional OS. With NVIDIA® Optimus™ technology, full enablement of all discrete graphics video and display features may not be supported on all systems (e.g. OpenGL applications will run on the integrated GPU or the APU as the case may be).

DISPLAYS

Internal

eDP FHD Flat
43.9 cm (17.3") diagonal FHD UWVA anti-glare LED-backlit, 220 cd/m², 45% sRGB (1920 x 1080) [6,8]

eDP HD Flat
43.9 cm (17.3") diagonal HD+ anti-glare LED-backlit, 220 cd/m², 45% sRGB (1600 x 900) [6,8]

Display Size
17.3"
43.9 cm (17.3")

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

Features

Docking station model	Total number of supported displays (incl. the notebook display)	Max. resolutions supported	Dock Connect3ors	Technical limitations
HP UltraSlim Docking Station	3	Dual 2.5K @ 60Hz	2xDP, 1xVGA	Dual 2.5k only with both displays into DP
HP Thunderbolt Dock 120W G2	3	Dual 4k @60Hz	2xDP, 1xVGA, 1xTB,1xUSB-C alt-mode	Dual 4k only with one display in to DP and + TB port or USB-C alt mode + TB port
HP USB-C Dock G4	3	Dual 2K @ 60Hz Single 4K @ 60Hz (3840 x 1440)	1xHDMI, 2xDP	
HP USB-C Universal Dock	3	Dual 4K @ 60Hz Single 5K @ 60Hz	2xDP	
HP USB-C Travel Dock	2	Single 2K @ 60Hz	1xHDMI, 1xVGA	Single external display Only HDMI or VGA at the time
HP USB-C Mini Dock	2	Single 4K @ 30Hz	1xHDMI, 1xVGA	Single external display Only HDMI or VGA at the time

STORAGE AND DRIVES

Hard Drives
500 GB SATA (7200 rpm) [9]
500 GB (8 GB cache) SATA SSHD (5400 rpm) [9]
1 TB SATA (5400 rpm) [9]

Primary M.2 Storage
16 GB Intel® Optane™ Memory
128 GB M.2 SATA TLC SSD [9]
256 GB M.2 PCIe NVMe Value SSD [9]
512 GB M.2 PCIe NVMe TLC SSD [9]

9. 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

Standard
16 GB DDR4-2400 SDRAM (1 x 16 GB) [10]
16 GB DDR4-2400 SDRAM (2 x 8 GB) [10]
12 GB DDR4-2400 SDRAM (4 and 8 GB) [10]
8 GB DDR4-2400 SDRAM (1 x 8 GB) [10]
8 GB DDR4-2400 SDRAM (2 x 4 GB) [10]
4 GB DDR4-2400 SDRAM (1 x 4 GB) [10]

Features

Maximum
32 GB DDR4-2400 SDRAM [10]

2 SODIMM
Both slots are customer accessible / upgradeable
DDR4 PC4 SODIMMS, system runs at 2133 (Intel 8th Gen CPU runs at 2400)
Supports Dual Channel Memory

10. 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

Wireless LAN (WLAN)
Realtek 802.11ac (1x1) WiFi® and Bluetooth® 4.2 Combo [11]
Realtek 802.11ac (2x2) WiFi® and Bluetooth® 4.2 Combo [11]
Intel® Dual Band Wireless-AC 3168 802.11 a/b/g/n/ac (1x1) WiFi® and Bluetooth® 4.2 Combo (non-vPro™) [11]
Intel® Dual Band Wireless-AC 8265 802.11a/b/g/n/ac (2x2) WiFi® and Bluetooth® 4.2 Combo (non-vPro™) [11]

Ethernet
Realtek RTL8111HSH Gigabit Ethernet

11. Wireless access point and Internet service required and sold separately. Availability of public wireless access points 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.

AUDIO/MULTIMEDIA

Audio
2 Integrated stereo speakers
Integrated dual array microphone

Webcam
HD webcam [6,12]

6. HD content required to view HD images.
12. Internet access required.

KEYBOARDS/POINTING DEVICES/BUTTONS & FUNCTION KEYS

Keyboard
HP Premium Keyboard
Full-sized island-style, spill resistant

Pointing Device
Clickpad with multi-touch gesture support image sensor, taps enabled as default

Features

Buttons and Function Keys
Separate launch buttons provide easy access to wireless on/off and speaker mute. Function keys provide control of features including: standby mode, display brightness, external display, microphone mute, volume down, volume up, and backlight toggle for backlit keyboard (select models only).

Function Keys
ESC: system information
F1 - Display Switching
F2 - Blank
F3 - Brightness Down
F4 - Brightness Up
F5 - Speaker Mute
F6 - Volume Down
F7 – Volume Up
F8 - Mic Mute
F9 - Backlight Toggle (for backlit keyboard) or Blank
F10 - Blank
F11 - Wifi Toggle
F12 - Sleep

Hidden Fuctions
Fn+R = Break
Fn+S = Sys Rq
Fn+C = Scroll Lock

Gestures
Enabled by default Win 10
2 Finger Scrolling
2 Finger Zoom (Pinch)
OSD (enable/disable)
3 finger tap = Cortana
3 finger flick = App switch
4 finger tap = Action Center

Disabled by default Win 10
3 Finger Flick
2 Finger Rotate
Momentum Motion
1 Finger Vertical Scroll

SOFTWARE AND SECURITY

BIOS

HP BIOSphere Gen4 [13]

HP DriveLock & Automatic DriveLock

BIOS Update via Network

Master Boot Record Security

Power On Authentication

Secure Erase [14]

Absolute Persistence Module [15]

Pre-boot Authentication

Features

Software

HP Native Miracast Support [16]

HP LAN-Wireless Protection

HP Wireless Wakeup

HP Connection Optimizer

HP 3D DriveGuard 6

HP ePrint + JetAdvantage [17]

HP Hotkey Support

HP Recovery Manager

HP Jumpstart

HP Support Assistant [18]

HP Noise Cancellation Software

Buy Office

Bing Search

Manageability Features

HP Driver Packs [19]

HP System Software Manager

HP BIOS Config Utility (BCU)

HP Client Catalog

HP Management Integration Kit for Microsoft System Center Configuration Manager [20]

LANDESK Management [21]

Client Security Software

HP Client Security Suite Gen3 [22] including:

HP Security Manager (including Credential Manager and Password Manager

HP DriveLock

HP Fingerprint Sensor

HP Password Manager [23]

Microsoft Defender [24]

TPM 2.0

13. HP BIOSphere Gen4 requires Intel® 7th or 8th Generation processors.
14. Secure Erase for the methods outlined in the National Institute of Standards and Technology Special Publication 800-88. Supported on Elite platforms with BIOS version F.03 or higher.
15. Absolute agent is shipped turned off, and will be activated when customers activate a purchased subscription. Subscriptions can be purchased for terms ranging multiple years. Service is limited, check with Absolute for availability outside the U.S. The Absolute Recovery Guarantee is a limited warranty. Certain conditions apply. For full details visit: http://www.absolute.com/company/legal/agreements/ computrace-agreement. Data Delete is an optional service provided by Absolute Software. If utilized, the Recovery Guarantee is null and void. In order to use the Data Delete service, customers must first sign a Pre-Authorization Agreement and either obtain a PIN or purchase one or more RSA SecurID tokens from Absolute Software.
16. Miracast is a wireless technology your PC can use to project your screen to TVs, projectors, and streaming media players that also support Miracast. You can use Miracast to share what you're doing on your PC and present a slide show. For more information: http://windows.microsoft.com/en-us/windows-8/project-wireless-screen-miracast.

Not all configuration components are available in all regions/countries.

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Features

17. HP ePrint Drive requires an Internet connection to HP web-enabled printer and HP ePrint account registration (for a list of eligible printers, supported documents and image types and other HP ePrint details, see www.hp.com/go/eprintcenter). Print times and connection speeds may vary.
18. HP Support Assistant requires Windows and Internet access.
19. HP Driver Packs not preinstalled, however available for download at http://www.hp.com/go/clientmanagement.
20. HP Management Integration Kit can be downloaded from http://www8.hp.com/us/en/ads/clientmanagement/overview.html.
21. LANDESK Management subscription required.
22. HP Client Security Suite Gen3 requires Windows and Intel® or AMD 7th or 8th Generation processors.
23. HP Password Manager requires Internet Explorer or Chrome or FireFox. Some websites and applications may not be supported. User may need to enable or allow the add-on / extension in the internet browser.
24. Microsoft Defender Opt in and internet connection required for updates.

POWER

Power Supply

65 W HP Smart AC adapter [25]
65 W EM Smart AC adapter [25]

Battery
3-cell, 48 Wh Long Life Li-ion [26]

Power Cord
3-wire plug - 1m
3-wire plug - 1.8m

Battery life
Up to 14 hours and 15 mins (i3, HD with SSD) [27]
Up to 13 hours and 45 mins (i5 quad core, HD with SSD) [27]

25. Availability may vary by country.
26. Battery is internal and not replaceable by customer. Serviceable by warranty.
27. 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 www.bapco.com for additional details.

WEIGHTS & DIMENSIONS

Weight
Starting at 5.5 lb [28]
Starting at 2.5 kg [28]

Dimensions (w x d x h)
14.8 x 10.4 x 0.82 in
41.38 x 27.6 x 2.25 cm

28. Weight will vary by configuration.

PORTS/SLOTS

Features

Ports
1 USB 3.1 Type-C™
1 USB 2.0 (powered port)
2 USB 3.1 Gen 1
1 HDMI 1.4b [29]
1 RJ-45
1 VGA
1 AC power
1 headphone/microphone combo jack

Expansion Slots
1 multi-format digital media reader
Supports SD, SDHC, SDXC.

29. HDMI cable sold separately.

ENVIRONMENTAL & INDUSTRY

Environmental Data	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® • EPEAT® Silver registered in the United States. 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, 60Hz**
	Normal Operation (Short idle)	9.69 W	9.70 W	9.55 W
	Normal Operation (Long idle)	3.43 W	3.48 W	3.45 W
	Sleep	0.67 W	0.69 W	0.67 W
	Off	0.40 W	0.45 W	0.42 W
		Note: 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, 60Hz**
	Normal Operation (Short idle)	33 BTU/hr	33 BTU/hr	33 BTU/hr

Features

Normal Operation (Long idle)	12 BTU/hr	12 BTU/hr	12 BTU/hr
Sleep	2 BTU/hr	2 BTU/hr	2 BTU/hr
Off	1 BTU/hr	2 BTU/hr	1 BTU/hr

*NOTE: 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	2.9	22
Fixed Disk – Random writes	3.2	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: 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: CR2032 (coin cell) Battery type: Lithium"
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 0% post-consumer recycled plastic (by wt.) • This product is 94.4% recycle-able when properly disposed of at end of life."

Packaging Materials	**External:**	PAPER/Corrugated	410 g
	Internal:	PLASTIC/EPE (Expanded Polyethylene)	70 g
		PLASTIC/Polyethylene low density	11 g
	The plastic packaging material contains at least 50% recycled content.		
	The corrugated paper packaging materials contains at least 75% recycled content.		
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):		

Not all configuration components are available in all regions/countries.

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Features

		- 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, 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 Recycling	Hewlett-Packard 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. 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.

Features

	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://h20195.www2.hp.com/V2/GetDocument.aspx?docname=c04755842 http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/cert.pdf

Features

SERVICE AND SUPPORT

Warranty

3 year and 1 year limited warranties and 90-day software limited warranty options depending on country. Batteries have a default one year limited warranty except for Long Life batteries which will have same 1-year or 3-year limited warranty as the platform. 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 Tool at http://www.hp.com/go/cpc [30]

30. 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 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 rights are not in any way affected by the HP terms and conditions of service or the HP Limited Warranty provided with your HP Product.

QuickSpecs

Technical Specifications

SYSTEM UNIT

Stand-Alone Power Requirements (AC Power)

Nominal Operating Voltage

19V

Average Operating Power

Win 10

Integrated graphics | N/A

Discrete Graphics | 8.89W

Max Operating Power | Discrete < 65W

Temperature

Operating | 32° to 95° F (0° to 35° C)

Non-operating | -4° to 140° F (-20° to 60° C)

Relative Humidity

Operating | 10% to 90%, non-condensing

Non-operating | 5% to 95%, 101.6° F (38.7° C) maximum wet bulb temperature

Shock

Operating | 40 G, 2 ms, half-sine

Non-operating | 200 G, 2 ms, half-sine

Random Vibration

Operating | 0.75 grms

Non-operating | 1.50 grms

Altitude (unpressurized)

Operating | -50 to 10,000 ft (-15.24 to 3,048 m)

Non-operating | -50 to 40,000 ft (-15.24 to 12,192 m)

Planned Industry Standard Certifications

UL | Yes
CSA | Yes
FCC Compliance | Yes
ENERGY STAR 7.0® | Selected models [31]
EPEAT® 2019 | Yes, Silver in U.S. [32]
ICES | Yes
Australia / | Yes
NZ A-Tick Compliance | Yes
CCC | Yes
Japan VCCI Compliance |

Yes

Technical Specifications

KC	Yes
BSMI	Yes
CE Marking Compliance	
	Yes
BNCI or BELUS	Yes
CIT	Yes
GOST	Yes
Saudi Arabian Compliance (ICCP)	
	Yes
SABS	Yes
UKRSERTCOMPUTER	Yes

31. Configurations of the HP ProBook 470 G4 is ENERGY STAR® qualified are identified as HP ProBook 470 G4 ENERGY STAR on HP websites and on http://www.energystar.gov.

32. 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" diagonal FHD UWVA anti-glare LED-backlit non-touch; 300 cd/m2; 45% sRGB (1920 x 1080)		
	Outline Dimensions (W x H x D)	400 x 233.3 (mm) max
	Active Area	381.89 x 214.81 (mm)
	Weight	550 g max
	Diagonal Size	17.3 (inch)
	Thickness	4.0 (mm) max
	Interface	eDP 1.3
	LCD Mode	IPS
	PPI	
	Surface Treatment	Anti-Glare (AG)
	Touch Enabled	None
	Contrast Ratio	600:1 (typical)
	Refresh Rate	60 Hz
	Brightness	300 nits
	Pixel Resolution	1920 x 1080 (FHD)
	Format	RGB
	Backlight	LED
	Color Gamut Coverage	72%
	Color Depth	6 bits + Hi FRC
	Viewing Angle	UWVA 85/85/85/85

Technical Specifications

17.3" diagonal HD+ anti-glare LED-backlit non-touch; 220 cd/m2; 45% sRGB (1600 x 900)		
Outline Dimensions (W x H x D)	398.6 x 251 (mm) max	
Active Area	382.08 x 214.92 (mm)	
Weight	550 g max	
Diagonal Size	17.3 (inch)	
Thickness	4.0 (mm) max	
Interface	eDP 1.3	
LCD Mode	TN	
PPI		
Surface Treatment	Anti-Glare (AG)	
Touch Enabled	None	
Contrast Ratio	300:1 (typical)	
Refresh Rate	60 Hz	
Brightness	220 nits	
Pixel Resolution	1600 x 900 (HD+)	
Format	RGB	
Backlight	LED	
Color Gamut Coverage	60%	

STORAGE AND DRIVES

HARD DRIVES

500 GB 7200 rpm SATA Hard Drive		
Drive Weight	0.20 lbs (92 g) ~ 0.21 lbs (95 g)	
Rotation Speed	7200 rpm	
Cache Buffer	Up to 32 MB	
NAND Type/Size	N/A	
Height	0.28 in (7 mm)	
Width	2.75 in (69.85 mm)	
Interface	ATA-8, SATA 3.0	
Interface Transfer Rate	600 MB/s	
Seek Time	**Single Track**	2 ~ 1.5 ms
	Average	11 ~ 13 ms
	Maximum	18 ~ 22 ms
Logical Blocks	976,773,168	
Operating Temperature	32° to 140° F (0° to 60° C) [top cover temp]	
Security Features	ATA Security	
Other Features	S.M.A.R.T., NCQ, Ultra DMA	

500 GB 5400 rpm SMART SATA Hybrid HDD/SSHD		
Drive Weight	0.20 lbs (92 g) ~ 0.21 lbs (95 g)	
Rotation Speed	5400 rpm	
Cache Buffer	64 MB	
NAND Type/Size	TLC/8GB	

Not all configuration components are available in all regions/countries.
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Technical Specifications

Height	0.28 in (7 mm)		
Width	2.75 in (69.85 mm)		
Interface	ATA-8, SATA 3.0		
Interface Transfer Rate	600 MB/s		
Seek Time	**Single Track**	2 ms	
	Average	12 ms	
	Maximum	22 ms	
Logical Blocks	976,773,168		
Operating Temperature	32° to 140° F (0° to 60° C) [top cover temp]		
Security Features	ATA Security		
Other Features	S.M.A.R.T., NCQ, Ultra DMA		

1TB 5400 rpm SATA Hard Drive	**Drive Weight**	0.21 lbs (94 g)	
	Rotation Speed	5400 rpm	
	Cache Buffer	Up to 32 MB	
	NAND Type/Size	N/A	
	Height	0.28 in (7.2 mm)	
	Width	2.75 in (69.85 mm)	
	Interface	ATA-8, SATA 3.0	
	Interface Transfer Rate	600 MB/s	
	Seek Time	**Single Track**	2 ms
		Average	12 ~ 13 ms
		Maximum	18 ~ 22 ms
	Logical Blocks	1,953,525,168	
	Operating Temperature	32° to 140° F (0° to 60° C) [top cover temp]	
	Security Features	ATA Security	
	Other Features	S.M.A.R.T., NCQ, Ultra DMA	

SOLID STATE DRIVES

128GB 2280 M2 SATA-3 TLC Solid State Drive	**Form Factor**	M.2 2280
	Capacity	127 GB
	NAND Type	TLC
	Height	0.09 in (2.3 mm)
	Width	0.87 in (22 mm)
	Weight	0.01 lb (6 g) ~ 0.02 lb (10 g)
	Interface	ATA-8, SATA 3.0
	Maximum Sequential Read	Up To 535 MB/s
	Maximum Sequential Write	Up To 515 MB/s
	Logical Blocks	250,069,680
	Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]

Not all configuration components are available in all regions/countries.
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	Features	DIPM; TRIM; DEVSLP

256GB 2280 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 Gen3
	Maximum Sequential Read	Up To 1700 MB/s
	Maximum Sequential Write	Up To 600 MB/s
	Logical Blocks	500,118,192
	Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]
	Features	TRIM; L1.2

512GB 2280 M2 PCIe NVMe TLC Solid State Drive	Form Factor	M.2 2280
	Capacity	512 GB
	NAND Type	TLC
	Height	0.09 in (2.3 mm)
	Width	0.87 in (22 mm)
	Interface	PCIe NVMe Gen3
	Maximum Sequential Read	Up To 2600 MB/s
	Maximum Sequential Write	Up To 1400 MB/s
	Logical Blocks	1,000,215,216
	Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]
	Features	TRIM; L1.2

NETWORKING/COMMUNICATIONS

WLAN

Intel 802.11 a/b/g/n/AC (2x2) WiFi and Bluetooth® Combo	**Wireless LAN Standards**	IEEE 802.11a
		IEEE 802.11b
		IEEE 802.11g
		IEEE 802.11n
		IEEE 802.11ac
	Interoperability	Wi-Fi certified
	Frequency Band	802.11b/g/n
		• 2.402 – 2.482 GHz
		802.11a/n
		• 4.9 – 4.95 GHz (Japan)

Not all configuration components are available in all regions/countries.
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Technical Specifications

	• 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 ~ MCS7, (1SS) (20MHz, 40MHz, and 80MHz)
Modulation	Direct Sequence Spread Spectrum BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM
Security[1]	• IEEE and WiFi 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 • Cisco Certified Extensions, all versions through CCX4 and CCX Lite • 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 : +16dBm minimum • 802.11g : +14dBm minimum • 802.11a : +14dBm minimum • 802.11n HT20(2.4GHz) : +14dBm minimum • 802.11n HT40(2.4GHz) : +12dBm minimum • 802.11n HT20(5GHz) : +14dBm minimum • 802.11n HT40(5GHz) : +12dBm minimum • 802.11ac 80MHz(5GHz) : +11dBm minimum
Power Consumption	Transmit: 2.0 W (max) Receive: 1.6 W (max) Idle mode (PSP): 180 mW (WLAN Associated) Idle mode: 50 mW (WLAN unassociated) Connect Standby: 10 mW (WLAN+BT) Radio disabled: 5 mW
Power Management	ACPI and PCI Express compliant power management 802.11 compliant power saving mode
Receiver Sensitivity[3]	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

Not all configuration components are available in all regions/countries.

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	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	
Dimensions	Type 2230 : 2.3 x 22.0 x 30.0 mm	
Weight	Type 2230 : 2.8g	
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 White – Radio ON	

1. Check latest software/driver release for updates on supported security features.
2. Maximum output power may vary by country according to local regulations.
3. 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).

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

Bluetooth Specification	4.0/4.1/4.2 Compliant
Frequency Band	2402 to 2480 MHz
Number of Available Channels	Legacy : 0~79 (1 MHz/CH) BLE : 0~39 (2 MHz/CH)
Data Rates and Throughput	Legacy : 3 Mbps data rate; throughput up to 2.17 Mbps
	BLE : 1 Mbps data rate; throughput up to 0.2 Mbps 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
Electrical Interface	USB 2.0 compliant
Bluetooth Software Supported Link Topology	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	ETS 300 328, ETS 300 826
Certifications	Low Voltage Directive IEC950
	UL, CSA, and CE Mark
Bluetooth Profiles	BT4.1-ESR 5/6/7 Compliance

Technical Specifications

	Supported	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)

Intel 802.11 a/b/g/n/AC (1x1) WiFi and Bluetooth® Combo[1]	**Wireless LAN Standards**	IEEE 802.11a
		IEEE 802.11b
		IEEE 802.11g
		IEEE 802.11n
		IEEE 802.11ac
	Interoperability	Wi-Fi certified
	Frequency Band	802.11b/g/n
		• 2.402 – 2.482 GHz
		802.11a/n
		• 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 ~ MCS7, (1SS) (20MHz, 40MHz, and 80MHz)
	Modulation	Direct Sequence Spread Spectrum BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM
	Security[3]	• IEEE and WiFi 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
		• Cisco Certified Extensions, all versions through CCX4 and CCX Lite
		• WAPI
	Network Architecture	Ad-hoc (Peer to Peer)

Not all configuration components are available in all regions/countries.
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Technical Specifications

Models	Infrastructure (Access Point Required)
Roaming	IEEE 802.11 compliant roaming between access points
Output Power[2]	• 802.11b : +14dBm minimum • 802.11g : +12dBm minimum • 802.11a : +12dBm minimum • 802.11n HT20(2.4GHz) : +12dBm minimum • 802.11n HT40(2.4GHz) : +12dBm minimum • 802.11n HT20(5GHz) : +10dBm minimum • 802.11n HT40(5GHz) : +10dBm minimum • 802.11ac VHT80(5GHz) : +10dBm minimum
Power Consumption	Transmit: 2.0 W (max) Receive: 1.6 W (max) Idle mode (PSP): 180 mW (WLAN Associated) Idle mode: 50 mW (WLAN unassociated) Connect Standby: 10 mW (WLAN+BT) Radio disabled: 8 mW
Power Management	ACPI and PCI Express compliant power management 802.11 compliant power saving mode
Receiver Sensitivity[3]	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
Dimensions	Type 2230 : 2.3 x 22.0 x 30.0 mm
Weight	Type 2230 : 2.8g
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 White – Radio ON

1. Check latest software/driver release for updates on supported security features.
2. Maximum output power may vary by country according to local regulations.
3. 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).

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

Technical Specifications

Bluetooth Specification	4.0/4.1/4.2 Compliant
Frequency Band	2402 to 2480 MHz
Number of Available Channels	Legacy : 0~79 (1 MHz/CH) BLE : 0~39 (2 MHz/CH)
Data Rates and Throughput	Legacy : 3 Mbps data rate; throughput up to 2.17 Mbps
	BLE : 1 Mbps data rate; throughput up to 0.2 Mbps 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
Electrical Interface	USB 2.0 compliant
Bluetooth Software Supported **Link Topology**	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	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)

Realtek 802.11a/b/g/n/AC (2x2)	**Wireless LAN Standards**	IEEE 802.11a IEEE 802.11b IEEE 802.11g IEEE 802.11n IEEE 802.11ac

Not all configuration components are available in all regions/countries.
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Technical Specifications

WiFi and Bluetooth® 4.2 Combo [1]	Interoperability	Wi-Fi certified
	Frequency Band	802.11b/g/n

802.11b/g/n

- 2.402– 2.482 GHz

802.11a/n

- 5.15 – 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, and 80MHz)

Modulation
Direct Sequence Spread Spectrum
BPSK, QPSK, CCK, 16-QAM, 64-QAM,

Security[1]

- IEEE and WiFi 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
- Cisco Certified Extensions, all versions through CCX4 and CCX Lite
- 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 : +16dBm minimum
- 802.11g : +14dBm minimum
- 802.11a : +14dBm minimum
- 802.11n HT20(2.4GHz) : +13dBm minimum
- 802.11n HT40(2.4GHz) : +13dBm minimum
- 802.11n HT20(5GHz) : +12dBm minimum
- 802.11n HT40(5GHz) : +12dBm 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 and PCI Express compliant power management
802.11 compliant power saving mode

Receiver Sensitivity[3]
802.11b, 1Mbps : -94dBm maximum

Technical Specifications

	802.11b, 11Mbps : -86dBm maximum	
	802.11g, 6Mbps : -88dBm maximum	
	802.11g, 54Mbps : -74dBm maximum	
	802.11a, 6Mbps : -86dBm maximum	
	802.11a, 54Mbps : -72dBm maximum	
	802.11n, MCS07 : -69dBm maximum	
	802.11n, MCS15 : -66dBm maximum	
Antenna type	High efficiency antenna with spatial diversity, mounted in the display enclosure Two embedded 2.4 GHz antennas are provided to the card to support WLAN and Bluetooth communications (Support Dual antenna or Single antenna, depend on platform requirement)	
Form Factor	PCI-Express M.2 MiniCard	
Dimensions	Type 2230 : 2.3 x 22.0 x 30.0 mm	
Weight	Type 2230 : 2.8g	
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 White – Radio ON	

1. Check latest software/driver release for updates on supported security features.
2. Maximum output power may vary by country according to local regulations.
3. 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).

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

Bluetooth Specification	4.0/4.1/4.2 Compliant
Frequency Band	2402 to 2480 MHz
Number of Available Channels	Legacy : 0~79 (1 MHz/CH) BLE : 0~39 (2 MHz/CH)
Data Rates and Throughput	Legacy : 3 Mbps data rate; throughput up to 2.17 Mbps
	BLE : 1 Mbps data rate; throughput up to 0.2 Mbps 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

Technical Specifications

	Selective Suspend 17 mW
Electrical Interface	USB 2.0 compliant
Bluetooth Software Supported **Link Topology**	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	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)

Realtek 802.11a/b/g/n/ac (1x1) WiFi and Bluetooth® 4.2 Combo [1]	**Wireless LAN Standards**	IEEE 802.11a
		IEEE 802.11b
		IEEE 802.11g
		IEEE 802.11n
		IEEE 802.11ac
	Interoperability	Wi-Fi certified
	Frequency Band	802.11b/g/n
		• 2.402– 2.482 GHz
		802.11a/n
		• 5.15 – 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, and 80MHz)

Not all configuration components are available in all regions/countries.
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Technical Specifications

Modulation	Direct Sequence Spread Spectrum BPSK, QPSK, CCK, 16-QAM, 64-QAM,
Security[1]	• IEEE and WiFi 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 • Cisco Certified Extensions, all versions through CCX4 and CCX Lite • 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 : +14dBm minimum • 802.11g : +12dBm minimum • 802.11a : +12dBm minimum • 802.11n HT20(2.4GHz) : +12dBm minimum • 802.11n HT40(2.4GHz) : +12dBm minimum • 802.11n HT20(5GHz) : +10dBm minimum • 802.11n HT40(5GHz) : +10dBm minimum • 802.11ac VHT80(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 and PCI Express compliant power management 802.11 compliant power saving mode
Receiver Sensitivity[3]	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 2.4 GHz antennas are provided to the card to support WLAN and Bluetooth communications (Support Dual antenna or Single antenna, depend on platform requirement)
Form Factor	PCI-Express M.2 MiniCard

Technical Specifications

Dimensions	Type 2230 : 2.3 x 22.0 x 30.0 mm	
Weight	Type 2230 : 2.8g	
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 White – Radio ON	

1. Check latest software/driver release for updates on supported security features.
2. Maximum output power may vary by country according to local regulations.
3. 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).

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

Bluetooth Specification	4.0/4.1/4.2 Compliant
Frequency Band	2402 to 2480 MHz
Number of Available Channels	Legacy : 0~79 (1 MHz/CH) BLE : 0~39 (2 MHz/CH)
Data Rates and Throughput	Legacy : 3 Mbps data rate; throughput up to 2.17 Mbps
	BLE : 1 Mbps data rate; throughput up to 0.2 Mbps 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
Electrical Interface	USB 2.0 compliant
Bluetooth Software Supported **Link Topology**	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	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

Not all configuration components are available in all regions/countries.

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Technical Specifications

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)

POWER

HP 65W AC Adapter, nPFC 3Pin RC 4.5mm			
	Dimensions	4.25 x 1.85 x 1.47 in (10.8 x 4.7 x 3.74 cm)	
	Weight	1.81 lb (250g) max	
	Input	100 to 240 VAC	
		Input Efficiency	88% min at 115 VAC and 89% min at 230 VAC
		Input frequency range	47 to 63 Hz
		Input AC current	1.7 A at 90 VAC
	Output	**Output power**	65W
		DC output	19.5V
		Hold-up time	5 msec at 115 VAC input
		Output current limit	<11A, Over voltage protection- 29V max automatic shutdown
	Connector	4.5mm Barrel Type, 3 pin/grounded, mates with interchangeable cords	
	Environmental Design	**Operating temperature**	32° to 104° F (0° to 40° C)
		Non-operating (storage) temperature	-4° to 149° F (-20° to 65° C)
		Altitude	0 to 10,000 ft (0 to 3,048 m)
		Humidity	20% to 80%
		Storage Humidity	10% to 90%
	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.	

Not all configuration components are available in all regions/countries.
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Technical Specifications

65W 3-prong AC Adapter (EM Model)	Dimensions	102x55x30mm	
	Weight	270g +/- 10g	
	Input	Input Efficiency	87% min at 115V/230V
		Input frequency range	47 to 63 Hz
		Input AC current	1.7 A at 90 VAC and maximum load
	Output	DC output	65W(19.5V/3.33A)
		Hold-up time	5 msec at 115 VAC input
		Output current limit	<11A, Over voltage protection- 29V max automatic shutdown
	Connector	4.5mm Barrel Type, 3 pin/grounded, mates with interchangeable cords	
	Environmental Design	Operating temperature	0° to 35° C
		Non-operating (storage) temperature	-20° to 85° C
		Altitude	0 to 5,000 m
		Humidity	0% to 95%
		Storage Humidity	0% to 95%
	Safety Certifications	CE Mark - 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; Reliability - failure rate of less than 0.1% annually within the first three years of operation.	

HP 3-cell, Long Life 48 WHr Li-ion	Dimensions (H x W x L)	7.0. x180.48x88.95 mm (0.273 x 7.09 x 3.49 inch)	
	Weight	0.22 kg (0.48lb)	
	Cells/Type	3cell Lithium-Ion	
	Energy	**Voltage**	11.4V/ 10.95V
		Amp-hour capacity	4.212Ah /4.385Ah
		Watt-hour capacity	48Wh
	Temperature	**Operating (Charging)**	32˚ to 113˚ F (0˚ to 45˚ C)
		Operating (Discharging)	14˚ to 122˚ F (-10˚ to 60˚ C)
		Non-operating	-4˚ to 122˚ F (-20˚ to 60˚ C)
	Battery Re-Charge Time	**System in OFF or Standby Mode**	<3 hours
	Fuel Gauge LED	No	
	Warranty	1-year*	
	Optional Travel Battery Available	No	

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Technical Specifications

*Batteries have a default one year limited warranty except for Long Life batteries which will have same
1-year or 3-year limited warranty as the platform.

Country of Origin

China

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

Type	Description	Part Number
Docking	HP USB-C Dock G4	3FF69AA
	HP 3005pr USB3 Port Replicator	Y4H06AA
	HP Thunderbolt Dock 120W G2	2UK37AA
	HP USB-C Travel Dock	T0K29AA
	HP USB Travel Dock	T0K30AA
	HP Elite USB-C Dock G3	2DW60AA
	HP USB-C Mini Dock	1PM64AA
	HP USB-C Universal Dock	1MK33AA
Input/Output	HP Slim USB Keyboard and Mouse	T6T83AA
	HP Slim Wireless Keyboard and Mouse	T6L04AA
	HP Ultra Mobile Wireless Mouse	H6F25AA
	HP Comfort Grip Wireless Mouse	H2L63AA
	HP 3-Button USB Laser Mouse	H4B81AA
	HP USB Travel Mouse	G1K28AA
	HP HDMI to DVI Adapter	F5A28AA
	HP USB-C to DP	N9K78AA
	HP USB-C to USB-A Hub	Z6A00AA
	HP Stereo 3.5mm Headset	T1A66AA
	HP Stereo USB Headset	T1A67AA
Memory	HP 4GB 2400MHz DDR4 Memory	Z4Y84AA
	HP 8GB 2400MHz DDR4 Memory	Z4Y85AA
	HP 16GB 2400MHz DDR4 Memory	Z4Y86AA
Power	HP 45W Smart AC Adapter 4.5mm	H6Y88AA
	HP 65W Smart AC Adapter	H6Y89AA
	HP 65W Slim AC Adapter	H6Y82AA
	HP 45W USB-C Power Adapter	1HE07AA
	HP 65W USB-C Power Adapter	1HE08AA
	HP Notebook Power Bank	N9F71AA
	HP USB-C Notebook Power Bank	1TZ86AA
Storage	HP External USB Optical Drive	F2B56AA
	HP 500GB 7200rpm HDD	F3B97AA
	HP External Portable USB3.0 HDD	K6A93AA
	HP 256GB Value 2280 M.2 SATA-3 SSD	1DE47AA
	HP 512GB TLC PCI-e 3x4 NVME 2280 M.2 SSD	1FU88AA
Security	HP Essential Combination Lock	T0Y16AA
	HP Combination Lock	T0Y15AA
	HP Keyed Cable lock	T0Y14AA
	HP Keyed Cable Lock 10mm	T1A62AA
	HP Conferencing Keyboard	K8P74AA
UCC	HP USB Collaboration Keyboard	Z9N38AA
	HP Wireless Collaboration Keyboard	Z9N39AA

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

	HP UC Wireless Mono Headset	W3K08AA
	HP UC Wireless Duo Headset	W3K09AA
	HP UC Speaker Phone	K7V16AA
	HP UC Wired Headset	K7V17AA
Displays	HP EliteDisplay S140u USB Portable Monitor	G8R65AA
	HP ProDisplay P240VA 23.8-inch Monitor	N3H14AA
	HP ProDisplay P232 23-inch Monitor	K7X31AA
	HP ProDisplay P223 21.5-inch Monitor	X7R61AA
	HP EliteDisplay E230t 23-inch Touch Monitor	W2Z50AA
	HP EliteDisplay E240c 23.8-inch Collaboration Monitor	M1P00A8

Summary of Changes

Date of change:	Version History:		Description of change:
August 22, 2017	From V1 to V2	Update	Change battery life information TBD
September 7, 2017	From V2 to V3	Update	Change battery life information to current
October 6, 2017	From V3 to V4	Update	TPM 2.0 added to Client Security Software
December 20, 2017	From V4 to V5	Update	Sku Z9R42AA removed
December 21, 2017	From V5 to V6	Update	Backlit keyboard available as an option removed
February 23, 2018	From V6 to V7	Update	HP Elite USB-C Docking Station (X7W54AA) removed from options section
April 5, 2018	From V7 to V8	Update	Processors added to Processors and processors family Dockings updated in options section
April 18, 2018	From V8 to V9	Update	At a glance section part 13
May 7, 2018	From V9 to V10	Added	Environmental tab
June 4, 2018	From V10 to V11	Update	Processors section
July 6, 2018	From V11 to V12	Update	Energy star
August 13, 2018	From V12 to V13	Remove	Software Velocity
September 5. 2018	From V13 to V14	Update	Processors and Docking section
October 2, 2018	From V14 to V15	Removed	Certification tab
January 7, 2019	From V15 to V16	Updated	Storage and Drives Section
June 12, 2019	From V16 to V17	Updated	EPEAT
August 5, 2019	From V17 to V18	Updated	Display Section