Overview

HP ProBook 445R G6 Notebook PC

Left

1. Internal microphones (2)
2. Webcam
3. Webcam LED
4. Clickpad
5. Hard Drive LED

6. SD Card Reader
7. Thermal Vent
8. USB 2.0 Port
9. Standard Security Lock Slot (Lock sold separately)
10. Power Button

Overview

Right

1.	Power Connector	5.	USB 3.1 Gen 1 port
2.	USB Type-C™ 3.1 Gen 1 port	6.	USB 3.1 Gen 1 port
3.	Ethernet Port (RJ-45)	7.	Headphone/Microphone Combo Jack
4.	HDMI Port (Cable not included)	8.	Optional HP Fingerprint Sensor

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

At a Glance

- Preinstall with Windows 10 versions or FreeDOS 3.0
- Choice of 2nd Generation AMD Ryzen™ processors
- Display include your choice of 35.56 cm (14") diagonal HD, Ultra Wide Viewing Angle FHD
- Integrated AMD Radeon™ Vega UMA Graphics
- Enhanced security features including TPM2.0, HP BIOSphere, Hardware enforced Firmware Protection, HP Fingerprint Sensor and optional IR camera[3]
- Passed 19 MIL-STD 810G tests, plus an additional 120,000 hours of reliability testing through HP's Total Test Process[1]
- Weight starting at 3.53 lbs (1.6 kgs)
- HP Long–Life Rechargeable batteries, with HP Fast Charge Technology recharges 50% in 30 minutes[2]
- Battery life up to 14 hours and 15 minutes
- Supports wireless LAN
- Up to 512 GB Solid State Drives and 1 TB Hard Drive
- 32 GB total system memory
- 720p HD webcam, IR camera for face authentication with Windows Hello
- Spill-resistant and optional backlit Keyboard[3], and Clickpad with multi-touch gestures enabled, taps enabled as default[3]

1. 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.
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.
3. Sold separately or as an optional feature.

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

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

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PRODUCT NAMES

HP ProBook 445R G6 Notebook PC

OPERATING SYSTEMS

Preinstalled   Windows 10 Pro 64[1]
Windows 10 Pro 64 (National Academic only)[2]
Windows 10 Home 64[1]
Windows 10 Home Single Language 64[1]
FreeDOS 3.0

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. 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

AMD Ryzen™ 7 PRO 3700U APU with Radeon™ Vega 10 Graphics (2.3 GHz base clock, up to 4 GHz max boost clock, 4 MB L3 cache, 4 cores)[3,4,5,6]
AMD Ryzen™ 5 3500U APU with Radeon™ Vega 8 Graphics (2.1 GHz base clock, up to 3.7 GHz max boost clock, 4 MB cache, 4 cores)[3,4,5,6]
AMD Ryzen™ 3 3300U APU with Radeon™ Vega 6 Graphics (2.1 GHz base clock, up to 3.5 GHz max boost clock, 4 MB cache, 4 cores) [3,4,5,6]
AMD Ryzen™ 3 3200U APU with Radeon™ Vega 3 Graphics (2.6 GHz base clock, up to 3.5 GHz max boost clock, 4 MB cache, 2 cores) [3,4,5,6]

Processors Family
AMD Ryzen™ APU processors[6]

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. AMD's numbering is not a measurement of clock speed.
4. Processor speed denotes maximum performance mode; processors will run at lower speeds in battery optimization mode.
5. AMD Max Burst frequency performance varies depending on hardware, software and overall system configuration.
6. 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.

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CHIPSET

Integrated with processor

GRAPHICS

Integrated
Radeon™ Vega Graphics[7]

Supports
Support HD decode, DX12, HDMI 1.4b to 4K 30 Hz

7.   HD content required to view HD images.

DISPLAYS

Internal
Non-Touch
35.56 cm (14") diagonal HD SVA eDP anti-glare LED backlit slim, 220 cd/m², 67% sRGB two WLAN antennas (1366 x 768)[7,8]
35.56 cm (14") diagonal HD SVA eDP anti-glare LED backlit slim, 220 cd/m², 67% sRGB for HD camera, one WLAN antenna (1366 x 768) [7,8]
35.56 cm (14") diagonal HD SVA eDP anti-glare LED backlit slim, 220 cd/m², 67% sRGB for HD camera and two WLAN antennas (1366 x 768) [7,8]
35.56 cm (14") diagonal HD SVA eDP anti-glare LED backlit slim, 220 cd/m², 67% sRGB for HD + IR camera and two WLAN antennas (1366 x 768) [7,8]
35.56 cm (14") diagonal FHD UWVA eDP anti-glare LED-backlit slim, 220 cd/m², 67% sRGB for two WLAN antennas (1920 x 1080) [7,8]
35.56 cm (14"") diagonal FHD UWVA eDP anti-glare LED-backlit slim, 220 cd/m², 67% sRGB for HD camera and one WLAN antenna (1920 x 1080) [7,8]
35.56 cm (14") diagonal FHD UWVA eDP anti-glare LED-backlit slim, 220 cd/m², 67% sRGB for HD camera and two WLAN antennas (1920 x 1080) [7,8]
35.56 cm (14") diagonal FHD UWVA eDP anti-glare LED-backlit slim, 220 cd/m², 67% sRGB for HD + IR camera and two WLAN antennas (1920 x 1080) [7,8]

Supports Narrow Bezel

HDMI
HDMI 1.4b up to 4K 30Hz

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

Technical Specifications

STORAGE AND DRIVES

Primary Storage
500 GB 7200 rpm SATA[9]
1 TB 5400 rpm SATA[9]

Primary M.2 Storage
128 GB SATA TLC Solid State Drive[9]
256 GB PCIe® NVMe™ Value Solid State Drive[9]
512 GB PCIe® NVMe™ TLC Solid State Drive[9]
512 GB PCIe® NVMe™ Value Solid State Drive[9]

Note: PCIe SSD not available for Celeron

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

Maximum Memory
32 GB DDR4-2400 SDRAM[10]

Memory
32 GB DDR4-2400 SDRAM (2 x 16 GB) [10]
16 GB DDR4-2400 SDRAM (1 x 16 GB) [10]
8 GB DDR4-2400 SDRAM (1 x 8 GB)
8 GB DDR4-2400 SDRAM (2 x 4 GB) [10]
4 GB DDR4-2400 SDRAM (1 x 4 GB)

Memory Slots
2 SODIMM
Both slots are customer accessible / upgradeable
DDR4 PC4 SODIMMS, system 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.

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

WLAN
Realtek RTL8821CE 802.11ac (1x1) Wi-Fi® + Bluetooth® 4.2 Combo[11]
Realtek RTL8822BE 802.11ac (2x2) Wi-Fi® + Bluetooth® 4.2 Combo[11]

Ethernet
Realtek RTL8111HSH-CG 10/100/1000 GbE NIC[12]

11. Wireless access point and Internet service required and sold separately. Availability of public wireless access points limited.
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
Integrated microphone (Mono or Dual Array)
2 Integrated stereo speakers

Speaker Power
2W/4ohm Per speaker

Camera
720p HD camera[7]
720p HD camera+IR Camera[7,13]

7. HD content required to view HD images.
13. Sold separately or as an optional feature.

KEYBOARDS/POINTING DEICES/BUTTONS & FUNCTION KEYS

Keyboard
HP Premium Keyboard, spill-resistant with optional backlit[14]
14. Sold separately or as an optional feature.

Pointing Device
Clickpad with multi-touch gesture support

Function Keys
F1 - Display Switching
F2 - Blank
F3 - Brightness Down
F4 - Brightness Up
F5 - Audio Mute
F6 - Volume Down
F7 - Volume Up
F8 - Mic Mute
F9 - Blank or Backlit Toggle

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F10 - Blank
F11 - Wireless
F12 - Sleep

Hidden Functions
Fn+R - Break
Fn+S - Sys Rq
Fn+C - Scroll Lock

SOFTWARE AND SECURITY

BIOS
HP BIOSphere Gen4[15]
HP DriveLock & Automatic DriveLock[16]
BIOS Update via Network
Secure Erase[17]
Absolute Persistence Module[18]
Pre-boot Authentication
HP Wireless Wakeup

Software
HP Native Miracast Support[19]
HP LAN-Wireless Protection
HP Connection Optimizer
HP 3D DriveGuard
HP Support Assistant[20]
HP Noise Cancellation Software
HP Host Based MAC Address Manager
Buy Office (Sold separately)

Manageability Features
HP Driver Packs[21]
HP System Software Manager (SSM)
HP BIOS Config Utility (BCU)
HP Client Catalog
HP Manageability Integration Kit Gen3[22]
HP Cloud Recovery[23]

Client Security Software
HP Client Security Suite Gen4[24] including:
HP Security Manager[25] (including Credential Manager, HP Password Manager, HP Spare Key)
HP Power On Authentication
Windows Defender[26]

Security Management
Secure Erase[17]
TPM 2.0 Embedded Security Chip shipped with Windows 10 (Common Criteria EAL4+ Certified)[27]
SATA 0,1 port disablement (viaBIOS)
Serial, USB enable/disable (viaBIOS)
Power-on password (viaBIOS)
Setup password (viaBIOS)
Support for chassis padlocks and cable lock devices
Integrated hood sensor

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HP Sure Click[28]

15. HP BIOSphere Gen4 requires Intel® or AMD 8th Gen processors. Features may vary depending on the platform and configurations.
16. HP Drive Lock & Automatic Drive Lock is not supported on NVMe drives
17. HP Secure Erase for the methods outlined in the National Institute of Standards and Technology Special Publication 800-88 "Clear" sanitation method.
18. 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.
19. Miracast is a wireless technology your PC can use to project your screen to TVs, projectors, and streaming.
20. HP Support Assistant requires Windows and Internet access.
21. HP Driver Packs not preinstalled, however available for download at http://www.hp.com/go/clientmanagement.
22. HP Manageability Integration Kit can be downloaded from http://www8.hp.com/us/en/ads/clientmanagement/overview.html
23. HP Cloud Recovery is available for HP Elite and Pro desktops and laptops PCs with Intel® or AMD processors and requires an open, wired network connection. Note: You must back up important files, data, photos, videos, etc. before use to avoid loss of data. Detail please refer to: https://support.hp.com/us-en/document/c05115630
24. HP Client Security Suite Gen 4 requires Windows and Intel® or AMD 7th or 8th generation processors.
25. 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.
26. Windows Defender Opt In, Windows 10, and internet connection required for updates.
27. 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).
28. HP Sure Click is available on most HP PCs and supports Microsoft® Internet Explorer and Chromium™. Supported attachments include Microsoft Office (Word, Excel, PowerPoint) and PDF files in read only mode, when Microsoft Office or Adobe Acrobat are installed.

POWER

Power Supply
HP Smart 65 W External AC power adapter[29]
HP Smart 65 W EM External AC power adapter[29]
HP Smart 65 W USB Type-C™ adapter[29]
HP Smart 45 W External AC power adapter[29]
HP Smart 45 W USB Type-C™ adapter[29]

Primary Battery
HP Long Life 3-cell, 45 Wh Li-ion polymer[30]

Battery Life
Up to 14 hours and 15 minutes[31]

Technical Specifications

Power Cord
3-wire plug - 1.8 m[29]
3-wire plug - 1.0 m[29]
2-wire plug - 1.0 m[29]
Duckhead power cord - 1.0 m[29]
Duckhead power cord - 1.8 m[29]

Battery Weight
0.22 kg
0.49 lb

29. Availability may vary by country.
30. Battery is internal and not replaceable by customer. Serviceable by warranty.
31. 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

Weight
Starting at 3.53 lbs[32]
Starting at 1.6 kgs[32]

Dimensions (w x d x h)
12.76 x 9.36 x 0.71 in
32.42 x 23.77 x 1.8 cm

32. Weight will vary by configuration.

PORTS/SLOTS

Ports
1 USB 3.1 Type-C™ Gen 1 (Power delivery, DisplayPort™ 1.2)
2 USB 3.1 Gen 1
1 USB 2.0 (Powered port)
1 HDMI 1.4b[33]
1 RJ-45
1 AC power
1 Stereo headphone/microphone combo jack

Expansion Slots
1 SD
Supports SD, SDHC, SDXC

33. HDMI cable sold separately.

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

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SERVICE AND SUPPORT

HP Services offers 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. 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 Tool at: http://www.hp.com/go/cpc. [34]

34. 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 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.

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® • EPEAT® Silver registered in the United States. See http://www.epeat.net for registration status in your country. • TCO Certified 8.0		
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)	7.656 W	7.764 W	7.680 W
Normal Operation (Long idle)	5.604 W	5.796 W	5.544 W
Sleep	0.564 W	0.588 W	0.564 W
Off	0.324 W	0.348 W	0.324 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)	26 BTU/hr	27 BTU/hr	26 BTU/hr
Normal Operation (Long idle)	19 BTU/hr	20 BTU/hr	19 BTU/hr
Sleep	2 BTU/hr	2 BTU/hr	2 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.		

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Declared Noise Emissions (in accordance with ISO 7779 and ISO 9296)	Sound Power (L$_{WAd}$, bels)	Sound Pressure (L$_{pAm}$, decibels)
Typically Configured – Idle	3	20
Fixed Disk – Random writes	3	20
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 • 2 SODIMM memory slots • 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: CR2032 (coin cell) Battery type: lithium/manganese dioxide	
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 3% post-consumer recycled plastic (by wt.) • This product is 94.5% recycle-able when properly disposed of at end of life.	

Packaging Materials	External:	PAPER/Corrugated	230 g
		PAPER/Paper	51 g
	Internal:	PLASTIC/Polyethylene Expanded - EPE	48 g
		PLASTIC/Polyethylene low density - LDPE	9 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		

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	• 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 Recycling	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. 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

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SYSTEM UNIT

Stand-Alone Power Requirements (AC Power)

Nominal Operating Voltage	19V
Average Operating Power	Windows 10
Integrated graphics	Data is not available (APU 15W)
Max Operating Power	UMA < 45W

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®	Selected models [35]
EPEAT® 2019	Yes, Silver in U.S. [36]
ICES	Yes
Australia	Yes
NZ A-Tick Compliance	Yes
CCC	Yes
Japan VCCI Compliance	Yes
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

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35. Configurations of the HP ProBook 445R G6 that are ENERGY STAR® certified[2] are identified as HP ProBook 445R G6 ENERGY STAR on HP websites and on http://www.energystar.gov.

36. 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.

Panel LCD 14 inch diagonal FHD (1920 x 1080) Anti-Glare WLED UWVA 45% NTSC 250 nits eDP slim		
	Outline Dimensions (W x H x D)	316.17 x 197.98 (max)
	Active Area	309.37 x 174.02 (typ.)
	Weight	285 g (max)
	Diagonal Size	14.0 inch
	Thickness	3.0 mm (max)
	Interface	eDP 1.2 (2 lane)
	Surface Treatment	Anti-glare
	Touch Enabled	No
	Contrast Ratio	600:1 (typ)
	Refresh Rate	60 Hz
	Brightness	250 nits
	Pixel Resolution	1920 x 1080 (FHD)
	Format of LCD Pixel Arrangement	RGB
	Backlight	LED
	Color Gamut Coverage	45% of NTSC
	Color Depth	6 bits
	Viewing Angle	UWVA 85/85/85/85

Panel LCD 14 inch diagonal FHD (1920 x 1080) Anti-Glare WLED UWVA 45% NTSC 220nits eDP slim NB		
	Outline Dimensions (W x H x D)	316.112 x 197.98 max.
	Active Area	309.312 x 173.988
	Weight	<280 g max.
	Diagonal Size	14.0"
	Thickness	3.0 mm max.
	Interface	eDP 1.2
	Surface Treatment	Anti-Glare
	Touch Enabled	No
	Contrast Ratio	600:1 (typical)
	Refresh Rate	60 Hz
	Brightness	220 nits typical (Panel Only)
	Pixel Resolution	1920 x 1080 (FHD)

Not all configuration components are available in all regions/countries.
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Format of LCD Pixel Arrangement	RGB
Backlight	LED
Color Gamut Coverage	45% of NTSC
Color Depth	6 bits + Hi FRC
Viewing Angle	UWVA 85/85/85/85

Panel LCD 14 inch diagonal HD (1366 x 768) Anti-Glare WLED SVA 45% NTSC 220nits eDP 1.2 w/o PSR slim NB	**Outline Dimensions (W x H x D)**	316.2 x 198.04 (max.)
	Active Area	309.4 x 173.95
	Weight	<280 g max.
	Diagonal Size	14.0"
	Thickness	3.0 mm max
	Interface	eDP 1.2 (1 lane)
	Surface Treatment	Anti-Glare
	Touch Enabled	No
	Contrast Ratio	300:1 (typ)
	Refresh Rate	60 Hz
	Brightness	220 nits typical (Panel Only)
	Pixel Resolution	1366 x 768 (HD)
	Format of LCD Pixel Arrangement	RGB
	Backlight	LED
	Color Gamut Coverage	45% of NTSC
	Color Depth	6 bits + Hi FRC
	Viewing Angle	SVA 40/40/15/30

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
	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: 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
	Features	S.M.A.R.T., NCQ, Ultra DMA

Not all configuration components are available in all regions/countries.
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1 TB 5400 rpm SATA Hard Drive	**Drive Weight**	0.21 lbs (94 g)
	Rotation speed	5400 rpm
	Cache Buffer	Up to 32 MB
	Height	0.28 in (7.2 mm)
	Width	2.75 in (69.85 mm)
	Interface	ATA-8, SATA 3.0
	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
	Features	S.M.A.R.T., NCQ, Ultra DMA

SSD 128 GB 2280 M2 SATA-3 TLC	**Form Factor**	M.2 2280
	Capacity	128GB
	NAND Type	TLC
	Height	0.09 in (2.3 mm)
	Width	0.87 in (22 mm)
	Weight	0.02 lb (10 g)
	Interface	ATA-8, SATA 3.0
	Maximum Sequential Read	Up To 520 MB/s
	Maximum Sequential Write	Up To 450 MB/s
	Logical Blocks	250,069,680
	Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]
	Features	DIPM; TRIM; DEVSLP

256 GB 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 1300 MB/s
	Logical Blocks	500,118,192
	Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]
	Features	TRIM; L1.2

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

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512 GB 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 Gen3X4
	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

SSD 512GB 2280 PCIe NVMe Value		
	Form Factor	M.2 2280
	Capacity	512 GB
	NAND Type	Value
	Height	0.09 in (2.3 mm)
	Width	0.87 in (22 mm)
	Interface	0.02 lb (10 g)
	Maximum Sequential Read	PCIe NVMe Gen3X4
	Maximum Sequential Write	Up To 1700 MB/s
	Logical Blocks	Up To 1500 MB/s
	Operating Temperature	1,000,215,215
	Features	32° to 158°F (0° to 70°C) [ambient temp]

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NETWORKING/COMMUNICATIONS

WLAN

Realtek 802.11a/b/g/n/ac (2x2) 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 •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, 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 •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

Technical Specifications

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

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)
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
Electrical Interface	USB 2.0 compliant

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

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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 Certifications	ETS 300 328, ETS 300 826 Low Voltage Directive IEC950UL, 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 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 •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, 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

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

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- 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: +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 10 mW 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. One embedded dual band 2.4/5 GHz antenna is provided to the card to support WLAN 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.
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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
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 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)

POWER

Technical Specifications

HP 45W Smart AC adapter	Dimensions (H x W x D)	3.74 x 1.57 x 1.04 in (9.5 x 4.0 x 2.65 cm)	
	Weight	0.386 lb (175g) max	
	Input	90 to 265 VAC	
		Input Efficiency	87.74% at 115Vac and 88.4% at 230Vac
		Input frequency range	47 to 63 Hz
		Input AC current	1.4 A at 90 VAC
	Output	**Output power**	45W
		DC output	19.5V
		Hold-up time	5 msec at 115 VAC input
		Output current limit	<8.0A
	Connector	4.5mm Barrel Type, 3 pin/grounded, mates with interchangeable cords	
	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 5,000 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.	

Not all configuration components are available in all regions/countries.
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HP 65W Smart AC adapter	**Dimensions**	90 x 51 x 28.5mm	
	Weight	unit: 220g +/- 10g	
	Input	**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	<11.0A
	Connector	4.5mm Barrel Type, 3 pin/grounded, mates with interchangeable cords	
	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 65W EM Smart AC adapter	**Dimensions**	102 x 55 x 30mm	
	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
		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%
		*CE Mark - full compliance with LVD and EMC directives	

Technical Specifications

	EMI and Safety Certifications	* 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.	
AC Adapter 65 Watt nPFC USB type C	**Dimensions**	74 x 74 x 28.5mm	
	Weight	unit: 245g +/- 10g	
	Input	**Input Efficiency**	81.5% min at 115 Vac/ 230Vac @ 5V/3A 86.7% min at 115 Vac/ 230Vac @ 9V/3A 88% min at 115 Vac/ 230Vac @ 10V/5A 88% min at 115 Vac/ 230Vac @ 12V/5A 89% min at 115 Vac/ 230Vac @ 15V/4.33A 89% min at 115 Vac/ 230Vac @ 20V/3.25A
		Input frequency range	47 to 63 Hz
		Input AC current	1.7 A at 90 VAC and maximum load
		Output power	65W
		DC output	5V/9V/10V/12V/15V/20V
		Hold-up time	5ms at 115 Vac input
		Output current limit	<8.0A
	Connector	Type C	
	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	0% to 95%
		Storage Humidity	0% 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.	
AC Adapter 45 Watt nPFC USB type C	**Dimensions**	62.0 x 62.0 x 28.5mm	
	Weight	unit: 220g +/- 10g	
	Input	**Input Efficiency**	Average Efficiency of 25%, 50%, 75%, 100% load condition with 115Vac/230Vac Spec:5V: 81.5%9V: 86.7%10V : 87.5%12V : 87.8%15V: 87.8%20V: 87.8%
		Input frequency range	47 to 63 Hz
		Input AC current	Max. 1.4 A at 90 Vac
		Output power	5V/15W 9V/27W

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

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		10V/37.5W 12V/45W 15V/45W 20V/45W
	DC output	5V/9V/10V/12V/15V/20V
	Hold-up time	5ms at 115 Vac input
	Output current limit	<5.0A
Connector	Type C	
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.	

3 Cell WHr 45 Long Life - Polymer HP Fast Charge Technology[1]	**Dimensions (H x W x L)**	6.0. x 184.7 x 88.9 mm
	Weight	0.22 kg (0.48lb)
	Cells/Type	3cell Lithium-Ion
	Voltage	11.55V
	Amp-hour capacity	3.900Ah
	Watt-hour capacity	45Wh
	Operating (Charging)	32˚ to 113˚ F (0˚ to 45˚ C)
	Operating (Discharging)	14˚ to 122˚ F (-10˚ to 60˚ C)

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.

Not all configuration components are available in all regions/countries.
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Options and Accessories (sold separately and availability may vary by country)

Type	Description	Part Number
Cases	HP Essential Top Load Case	H2W17AA#xxx
	HP Essential Backpack (up to 15.6")	H1D24AA
	HP Essential Messenger Case (up to 17.3")	H1D25AA
Dockings	HP USB-C Mini Dock	1PM64AA#xxx
	HP USB-C Universal Dock	1MK33AA#xxx
	HP USB-C Dock G4	3FF69AA#xxx
	HP TB Dock 120W w/Audio	3YE87AA#xxx
	HP Thunderbolt Dock 120W G2	2UK37AA#xxx
	HP TB Dock G2 w/ Combo Cable	3TR87AA#xxx
	HP TB Dock 120W G2 Cable	3XB94AA
	HP TB Dock G2 Combo Cable	3XB96AA
	HP TB Dock G2 Audio Module	3AQ21AA
	HP USB Travel Dock	T0K30AA#xxx
	HP USB-C Dock G5	5TW10AA#XXX
	HP USB-C/A Universal Dock G2	5TW13AA#XXX
Input/Output	HDMI to VGA Adapter	H4F02AA
	HP USB-C to HDMI 2.0 Adapter	1WC36AA
	HP USB-C to VGA Adapter	N9K76AA
	HP USB Essential Keyboard and Mouse	H6L29AA
	HP Comfort Grip Wireless Mouse	H2L63AA
	HP 3-Button USB Laser Mouse	H4B81AA
	HP USB Travel Mouse	G1K28AA
	HP Ultra Mobile Wireless Mouse	H6F25AA#xxx
	HP USB Collaboration Keyboard	Z9N38AA#xxx
UCC	HP Conferencing Keyboard	K8P74AA#xxx
	HP Speaker Phone	K7V16AA
	HP Wired Headset	K7V17AA
Other	DIB HP 400G6 HDD Bracket Kit	5LV47AV
Power	HP Power Bank	N9F71AA#xxx
	HP USB-C Power Bank	2NA10AA#xxx
	HP 45W LC USB-C Power Adapter	1MZ01AA#ABA
	HP 45W Smart AC Adapter 4.5mm	H6Y88AA#XXX
	HP 45W USB-C Power Adapter	1HE07AA#xxx
	HP 65W USB-C Power Adapter	1HE08AA#xxx
	HP 65W Slim AC Adapter	H6Y82AA#xxx
	HP 65W USB-C Power Adapter	3PN48AA

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

Storage	HP External USB Optical Drive	F2B56AA
	HP 500GB 7200rpm HDD	F3B97AA
	HP 512GB TLC PCI-e 3x4 NVMe SSD (2280)	1FU88AA
Memory	4GB 2666MHz DDR4	4VN05AA
	8GB 2666MHz DDR4	4VN06AA
	16GB 2666 MHz DDR4	4VN07AA
	4GB 2666MHz DDR4	4VN05AA
Security	HP Essential Keyed Cable lock 12.3mm	T0Y14AA
	HP Keyed Cable Lock 10mm	T1A62AA
	HP Combination Lock	T0Y15AA
	HP UltraSlim Keyed Cable Lock	T1A62AA
Displays	HP ProDisplay P240va 23.8 inch Monitor	N3H14AA
	HP ProDisplay P232 23 inch Monitor	K7X31AA
	HP EliteDisplay E223 21.5 inch Monitor	1FH45AA
	HP EliteDisplay E243 23.8-inch Monitor	1FH47AA
	HP EliteDisplay S14 14-inch Portable Display	3HX46AA

Summary of Changes

Date of change:	Version History:		Description of change:
May 7, 2019	V1 to V2	Added	Environmental Section
June 10, 2019	V2 to V3	Added	HP Cloud Recovery
July 24, 2019	V3 to V4	Updated	Color Gamut
July 25, 2019	V4 to V5	Added	Speaker in Audio Section
September 20, 2019	V5 to V6	Updated	Lock Slot and 250 nits Panel
October 11, 2019	V6 to V7	Added	DisplayPort™ 1.2
November 21, 2019	V7 to V8	Updated	Longevity and Upgrading section
November 25, 2019	V8 to V9	Added	Processor

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