

Overview

HP 245 G8 Notebook PC



Left

- | | |
|-------------------------------------|--|
| 1. Webcam LED | 7. Hard drive indicator LED |
| 2. Webcam | 8. SD Card slot |
| 3. Internal dual digital microphone | 9. USB-C® 3.2 Gen1 port (Data Transfer Only) |
| 4. Touchpad | 10. Nano Security lock slot (Lock sold separately) |
| 5. Touchpad buttons | 11. Power button |
| 6. Power indicator LED | |

Overview



Right

- | | | | |
|----|--------------------------------|----|----------------------|
| 1. | AC Smart Pin adapter plug | 4. | USB-A 3.2 Gen 1 port |
| 2. | RJ-45 / Ethernet port | 5. | USB-A 3.2 Gen 1 port |
| 3. | HDMI port (Cable not included) | 6. | Audio combo jack |

Overview

At a Glance

- A new compact narrow bezel design with thinner & lighter chassis
- Preinstall with Windows 10 versions or FreeDOS
- Choice of AMD Ryzen™, Athlon™ or AMD APU processors
- Choice of 35.56 cm (14"?) diagonal HD SVA Anti-Glare WLED or FHD IPS Anti-Glare WLED
- Choice of Integrated AMD Radeon™ Vega Graphics or Radeon™ Graphics
- Security features including Firmware TPM 2.0
- Weight starting at 3.25 lbs (1.47 kgs)
- MM18 Battery life up to 8 hours and 45 minutes
- Wireless LAN (WLAN) up to 802.11ac keep you connected
- One USB 3.2 Gen 1 Type-C® (Data Transfer Only), Two USB 3.2 Gen 1 Type-A
- Choice of Solid State Drives up to 1 TB and Hard Drive up to 1 TB
- Fast and upgradeable dual channel DDR4 SODIMM memory up to 16 GB
- HP webcam with dual digital microphone and HD (supporting WDR- Wide Dynamic Range) or VGA camera

1. Windows 10 MM18 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.

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

Technical Specifications

PRODUCT NAME

HP 245 G8 Notebook PC

OPERATING SYSTEMS

Preinstalled	Windows 10 Pro 64 - HP recommends Windows 10 Pro Windows 10 Pro 64 (National Academic only) ² Windows 10 Home 64 ¹ Windows 10 Home Single Language 64 ¹ FreeDOS
--------------	--

1. Not all features are available in all editions or versions of Windows. Systems may require upgraded and/or separately purchase 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.

Supported Version

HP tested Windows 10, version 1809 on this platform For testing information on newer versions of Windows10, please see: <https://support.hp.com/document/c05195282>.

PROCESSORS

- AMD Ryzen™ 5 3500U APU with Radeon™ Vega 8 Mobile Graphics (2.1 GHz base frequency, up to 3.7 GHz burst frequency, 4 MB cache, 4 cores) ^{3,4,5}
- AMD Ryzen™ 3 3300U APU with Radeon™ Vega 6 Graphics (2.1 GHz base frequency, up to 3.5 GHz burst frequency, 4 MB cache, 4 cores) ^{3,4,5}
- AMD Ryzen™ 3 3250U APU with Radeon™ Graphics (2.6 GHz base frequency, up to 3.5 GHz burst frequency, 1 MB cache, 2 cores) ^{3,4,5}
- AMD Athlon™ Gold 3150U APU with Radeon™ Graphics (2.4 GHz base frequency, up to 3.3 GHz burst frequency, 1 MB cache, 2 cores) ^{3,4,5}
- AMD Athlon™ Silver 3050U APU with Radeon™ Graphics (2.3 GHz base frequency, up to 3.2 GHz burst frequency, 1 MB cache, 2 cores) ^{3,4,5}
- AMD Athlon™ Pro 3145U APU with Radeon™ Graphics (2.4 GHz base frequency, up to 3.3 GHz burst frequency, 1 MB cache, 2 cores) ^{3,4,5}
- AMD Athlon™ Pro 3045U APU with Radeon™ Graphics (2.3 GHz base frequency, up to 3.2 GHz burst frequency, 1 MB cache, 2 cores)
- AMD 3020e APU with Radeon™ Graphics (1.2 GHz base frequency, up to 2.6 GHz burst frequency, 4 MB cache, 2 cores) ^{3,4,5}
- AMD A6-9225 APU with Radeon™ R4 Graphics (2.6 GHz base frequency, up to 3 GHz burst frequency, 1 MB cache, 2 cores) ^{3,4,5}
- AMD A4-9125 APU with Radeon™ R3 Graphics (2.3 GHz base frequency, up to 2.6 GHz burst frequency, 1 MB cache, 2 cores) ^{3,4,5}
- AMD PROA6-8350B APU with Radeon™ R4 Graphics (3.1 GHz base frequency, up to 3.7 GHz burst frequency, 1 MB cache, 2 cores) ^{3,4,5}
- AMD PROA4-5350B APU with Radeon™ R3 Graphics (3.0 GHz base frequency, up to 3.6 GHz burst frequency, 1 MB cache, 2 cores) ^{3,4,5}

Technical Specifications

Processors Family

AMD Ryzen™ 5 Mobile Processors ⁶
AMD Ryzen™ 3 Mobile Processors ⁶
7th Generation AMD A6 APU processor ⁶
7th Generation AMD A4 APU processor ⁶
AMD PRO APU processor ⁶
AMD Athlon™ Mobile Processors ⁶

3. Processor speed denotes maximum performance mode; processors will run at lower speeds in battery optimization mode.
4. 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.
5. AMD Max Boost 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>.

CHIPSET

Chipset is integrated with processor

GRAPHICS

Integrated

AMD Radeon™ Vega 8 Mobile Graphics
AMD Radeon™ Vega 6 Mobile Graphics
AMD Radeon™ Graphics
AMD Radeon™ R4 Graphics
AMD Radeon™ R3 Graphics

Supports

Support HD decode, DX12, HDMI 1.4b ⁷

7. HD content required to view HD images.

DISPLAYS

Internal

Non-Touch

35.56 cm (14") diagonal, HD (1366 x 768), SVA, Anti-Glare WLED, 250nits, eDP micro-edge, 45% NTSC ^{7,8,9}
35.56 cm (14") diagonal, FHD (1920 x 1080), IPS, Anti-Glare WLED, 250nits eDP micro-edge, 45% NTSC ^{7,8,9}

HDMI

Port supports resolutions up to 1920 x 1080 external resolution @60 Hz

7. HD content required to view HD images.

8. Sold separately or as an optional feature.

9. Resolutions are dependent upon monitor capability, and resolution and color depth settings.

Technical Specifications

STORAGE AND DRIVES

Primary Storage

- 1 TB 5400 rpm SATA ¹⁰
- 500 GB 7200 rpm SATA ¹⁰
- 500 GB 5400 rpm SATA ¹⁰

Primary M.2 Storage

- 128 GB M.2 SATA-3 TLC Solid State Drive ¹⁰
- 256 GB M.2 SATA-3 TLC Solid State Drive ¹⁰
- 256 GB PCIe® NVMe™ M.2 Value Solid State Drive ¹⁰
- 512 GB PCIe® NVMe™ M.2 Value Solid State Drive ¹⁰
- 1TB PCIe® NVMe™ M.2 Value Solid State Drive ¹⁰

Dual Storage

- 128 GB M.2 SATA-3 TLC Solid State Drive + 1TB 5400rpm SATA ¹⁰
- 256 GB PCIe® NVMe™ M.2 Value Solid State Drive + 1TB 5400rpm SATA ¹⁰

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

MEMORY

Maximum Memory

- 16 GB DDR4-2400 SDRAM ¹¹

Memory

- 16 GB DDR4-2400 SDRAM (2 X 8 GB) ¹¹
- 16 GB DDR4-2133 SDRAM (2 X 8 GB) ¹¹
- 12 GB DDR4-2400 SDRAM (4 GB (1 x 4GB) and 8 GB (1 x 8 GB)) ¹¹
- 12 GB DDR4-2133 SDRAM (4 GB (1 x 4GB) and 8 GB (1 x 8 GB)) ¹¹
- 8 GB DDR4-2400 SDRAM (2 x 4 GB) ¹¹
- 8 GB DDR4-2133 SDRAM (2 x 4 GB) ¹¹
- 8 GB DDR4-2400 SDRAM (1 x 8 GB) ¹¹
- 8 GB DDR4-2133 SDRAM (1 x 8 GB) ¹¹
- 8 GB DDR4-2400 SDRAM (1 x 4 GB) ¹¹
- 8 GB DDR4-2133 SDRAM (1 x 4 GB) ¹¹

Memory Slots

- 2 SODIMM (AMD Ryzen™ / Athlon™ Mobile Processors)
- Supports Dual Channel Memory
- 1 SODIMM

NOTE: All slots are customer non-accessible / non-upgradeable

11. 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

Technical Specifications

WLAN

Realtek RTL8822CE 802.11ac 2x2 Wi-Fi® + Bluetooth® 5 ²⁶

Realtek RTL8822CE 802.11a/b/g/n/ac (2x2) Wi-Fi® with Bluetooth® 4.2 Combo ¹²

Realtek RTL8822CE 802.11a/b/g/n/ac (1x1) Wi-Fi® with Bluetooth® 4.2 Combo ¹²

Miracast

Compatible with Miracast-certified devices (For Win10) ¹³

Ethernet

Realtek 10/100/1000 GbE NIC ¹⁴

12. Wi-Fi supporting gigabit speeds (802.11ac) is achievable when transferring files between two devices connected to the same router. Requires a wireless router, sold separately, that supports 160MHz channels.

13. Miracast is a wireless technology your PC can use to project your screen to TVs, projectors, and streaming.

14. 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.

26. Wireless access point and internet service required and sold separately. Availability of public wireless access points limited. Wi-Fi 5 (802.11 ac) is backwards compatible with prior 802.11 specs.

AUDIO/MULTIMEDIA

Audio

2 Integrated stereo speakers

Integrated dual digital microphone

Camera

HP TrueVision HD Camera ^{7,8}

Webcam

VGA webcam ⁸

7. HD content required to view HD images.

8. Sold separately or as an optional feature.

KEYBOARDS/POINTING DEVICES/BUTTONS & FUNCTION KEYS

Technical Specifications

Keyboard

Full Size Textured island-style Keyboard

Pointing Device

Touchpad with multi-touch gesture support (PTP certified)

Function Keys

F1 - Open " How to get help in Windows 10" webpage

F2 - Brightness Down

F3 - Brightness Up

F4 - Display Switching

F5 - Blank

F6 - Mute

F7 - Volume Down

F8 -Volume Up

F9 - Previous

F10 - Play/Pause

F11 - Next

F12 - Airplane mode

SOFTWARE AND SECURITY

Preinstalled Software

Software

HP Support Assistant ¹⁶

Native Miracast Support ¹⁷

HP documentation

HP Setup Integrated OOBE

HP SSRM

HP Audio Switch

HP JumpStarts

McAfee LiveSafe™ ¹⁵

Xerox® DocuShare® 90 day free trial offer²⁵

Security Management

Firmware TPM 2.0 (On select models)¹⁸

[15. 30 days free trial](#)

[16. HP Support Assistant requires Windows and Internet access.](#)

[17. Miracast is a wireless technology your PC can use to project your screen to TVs, projectors, and streaming.](#)

[18. Firmware TPM is version 2.0. which is a subset of the TPM 2.0 specification version v0.89 as implemented by Intel Platform Trust Technology \(PTT\).32. Firmware TPM is version 2.0.](#)

[25. Simply sign up and start using Xerox® DocuShare® Go. No credit card. No obligation. Data will become unavailable unless a subscription is entered before the end of the 90 day free trial period. See visit \[www.xerox.com/docusharego\]\(http://www.xerox.com/docusharego\) for details.](#)

POWER

Technical Specifications

Power Supply ¹⁹

HP Smart 65 W EM External AC power adapter ¹⁹
HP Smart 45 W External AC power adapter ¹⁹

Primary Battery

HP Long Life 3-cell, 41 Wh Li-ion ²⁰
HP Long Life 4-cell, 46 Wh Li-ion Battery (India only) ²⁰

Power Cord

1M (3.28 feet) length power cord

MM18 Battery life

Up to 8 hours and 45 minutes ²¹

Battery Weight

0.18 kg
0.39 lb

19. Availability may vary by country.
20. Battery is internal and not replaceable by customer. Serviceable by warranty.
21. Windows 10 MM18 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

Product Weight

Starting at 3.25 lb ²²
Starting at 1.47 kg ²²

Product Dimensions (w x d x h)

12.76 x 8.89 x 0.78 in
32.4 x 22.59 x 1.99 cm

22. Weight will vary by configuration.

PORTS/SLOTS

Technical Specifications

- Ports**
- 2 USB-A 3.2 Gen1
 - 1 USB Type-C 3.2 Gen1 (Data Transfer Only)
 - 1 HDMI v1.4b ²³
 - 1 RJ-45
 - 1 AC Power
 - 1 Headphone/microphone combo jack

- Expansion Slots**
- Support SD/SDHC/SDXC
 - 1 Multi-format digital media reader

23. HDMI cable sold separately.

SERVICE AND SUPPORT

1-year limited warranty and 90 day software limited warranty options depending on country. Batteries have a default one year limited warranty. Refer to <http://www.hp.com/support/batterywarranty/> for additional battery information. On-site service and extended coverage is also available. HP Care Pack Services are optional extended service contracts that go beyond the standard limited warranties. To choose the right level of service for your HP product, use the HP Care Pack Services Lookup Tool at: <http://www.hp.com/go/cpc>. ²⁴

24. 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.

SYSTEM UNIT

Stand-Alone Power Requirements (AC Power)

Nominal Operating Voltage	19.5 V
Average Operating Power	TBD
Integrated graphics	6.03W
Discrete Graphics	N/A (Switchable graphics design)
Max Operating Power	Discrete < 65W UMA < 45W

Temperature

Operating	32° to 95° F (0° to 35° C) (not writing optical) 41° to 95° F (5° to 35° C) (writing optical)
Non-operating	-4° to 140° F (-20° to 60° C)

Relative Humidity

Operating	10% to 90%, non-condensing
Non-operating	5% to 95%

Shock

Operating	40 G, 2 ms duration, half-sine
-----------	--------------------------------

Technical Specifications

Non-operating	240 G, 2 ms duration, half-sine
Random Vibration	
Operating	1.043 grms
Non-operating	3.5 grms
Altitude (unpressurized)	
Operating	-15 m to 3048 m (-50 ft to 10000 ft)
Non-operating	-15 m to 12192 m (-50 ft to 40000 ft)
Planned Industry Standard Certifications	
UL	Yes
CSA	No
FCC Compliance	Yes
ENERGY STAR®	Yes
EPEAT®	Yes
ICES	Yes
Australia /	No
NZ A - Tick Compliance	No
CCC	Yes
Japan VCCI Compliance	No
KC	No
BSMI	Yes
CE Marketing Compliance	Yes
BNCI or BELUS	No
CIT	No
GOST	No
Saudi Arabian Compliance (ICCP)	No
SABS	No
UKRSERTCOMPUTER	No

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-in FHD (1920x1080) Anti-Glare WLED UWVA 45percent cg 250nits eDP NWBZ slim	Outline Dimensions (W x H x D)	316.11 x 198.07 max. (w/ PCB)(mm)
	Active Area	309.31 x 173.99(mm)
	Weight	285g max.
	Diagonal Size	14.0"
	Thickness	3.0mm max.
	Interface	eDP 1.2
	Surface Treatment	Anti-glare (AG)
	Touch Enabled	None
	Contrast Ratio	600:1 (typ)
	Refresh Rate	60Hz
	Brightness	250nit typ.
	Pixel Resolution	1920 x 1080 (FHD)
	Format	RGB
	Backlight	LED
	Color Gamut Coverage	45%

Technical Specifications

	Color Depth	6bit
	Viewing Angle	UWVA 85/85/85/85
Panel LCD 14-in HD (1366x768) Anti-Glare WLED SVA 45percent cg 250nits eDP NWBZ ultraslim	Outline Dimensions (W x H x D)	315.9+/-0.3 x 197.55 +/- 0.5
	Active Area	309.4 x 173.95(mm)
	Weight	285g Max
	Diagonal Size	14"
	Thickness	3.0mm max
	Interface	eDP 1.2
	Surface Treatment	Anti-glare (AG)
	Touch Enabled	None
	Contrast Ratio	300:1 (typ)
	Refresh Rate	60Hz
	Brightness	250nit typ.
	Pixel Resolution	1366 x 768 (HD)
	Format	RGB
	Backlight	LED
	Color Gamut Coverage	45%
	Color Depth	6 bits
	Viewing Angle	SVA 45/45/15/30

STORAGE AND DRIVES*

*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.

SSD 128GB 2280 M2 SATA-3 TLC (SSD 128GB 2280 M2 SATA-3 TLC)	Drive Weight	0.01 lb (6 g) ~ 0.02 lb (10 g)
	Capacity	128 GB
	Height	0.09 in (2.3 mm)
	Width	0.87 in (22 mm)
	Interface	ATA-8, SATA 3.0
	Performance	
	Maximum Sequential Read	Up To 560 MB/s
	Maximum Sequential Write	Up To 530 MB/s
	Logical Blocks	250,069,680
	Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]
SSD 1TB 2280 PCIe NVMe Value (SSD 1TB 2280 PCIe NVMe Value)	Drive Weight	0.01 lb (6 g) ~ 0.02 lb (10 g)
	Capacity	1 TB
	Height	0.09 in (2.3 mm)
	Width	0.87 in (22 mm)
	Interface	PCIe NVMe Gen3X4
	Performance	
	Maximum Sequential Read	Up to 2400MB/s

Technical Specifications

	Maximum Sequential Write	Up to 1950MB/s
	Logical Blocks	2,000,409,264
	Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]

SSD 256GB 2280 M2 SATA-3 TLC (SSD 256GB 2280 M2 SATA-3 Three Layer Cell)	Drive Weight	0.01 lb (6 g) ~ 0.02 lb (10 g)
	Capacity	256 GB
	Height	0.09 in (2.3 mm)
	Width	0.87 in (22 mm)
	Interface	PCIe NVMe Gen3X4
	Performance	
	Maximum Sequential Read	Up to 530MB/s
	Maximum Sequential Write	Up to 520MB/s
	Logical Blocks	500,118,192
	Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]

SSD 256GB 2280 PCIe NVMe Value (SSD 256GB 2280 PCIe NVMe Value)	Drive Weight	0.01 lb (6 g) ~ 0.02 lb (10 g)
	Capacity	256GB
	Height	0.09 in (2.3 mm)
	Width	0.87 in (22 mm)
	Interface	PCIe NVMe Gen3X2
	Performance	
	Maximum Sequential Read	Up to 1500MB/s
	Maximum Sequential Write	Up to 750MB/s
	Logical Blocks	500,118,192
	Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]
	Features	TRIM, L1.2

SSD 512GB 2280 PCIe NVMe Value (SSD 512GB 2280 PCIe NVMe Value)	Drive Weight	0.01 lb (6 g) ~ 0.02 lb (10 g)
	Capacity	512GB
	Height	0.09 in (2.3 mm)
	Width	0.87 in (22 mm)
	Interface	PCIe NVMe Gen3X2
	Performance	
	Maximum Sequential Read	Up to 1500MB/s
	Maximum Sequential Write	Up to 750MB/s
	Logical Blocks	1,000,215,216
	Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]
	Features	TRIM, L1.2

Technical Specifications

NETWORKING/COMMUNICATIONS

Realtek RTL8822CE 802.11ac 2x2 Wi-Fi® + Bluetooth® 5 ¹	Wireless LAN Standards	IEEE 802.11a IEEE 802.11b IEEE 802.11g IEEE 802.11n IEEE 802.11ac IEEE 802.11d IEEE 802.11e IEEE 802.11h IEEE 802.11i IEEE 802.11k IEEE 802.11r IEEE 802.11v
	Interoperability	Wi-Fi certified modules
	Frequency Band	802.11b/g/n <ul style="list-style-type: none">2.402 - 2.482 GHz 802.11a/n/ac <ul style="list-style-type: none">4.9 - 4.95 GHz (Japan)5.15 - 5.25 GHz5.25 - 5.35 GHz5.47 - 5.725 GHz5.825 - 5.850 GHz
	Data Rates	<ul style="list-style-type: none">802.11b: 1, 2, 5.5, 11 Mbps802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps802.11n: 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 ²	<ul style="list-style-type: none">IEEE and WiFi compliant 64 / 128 bit WEP encryption for a/b/g mode onlyAES-CCMP: 128 bit in hardware802.1x authenticationWPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES.WPA2 certificationIEEE 802.11iWAPI
	Network Architecture Models	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)
	Roaming	IEEE 802.11 compliant roaming between access points
	Output Power ³	<ul style="list-style-type: none">802.11b : +18.5dBm minimum802.11g : +17.5dBm minimum802.11a : +18.5dBm minimum802.11n HT20(2.4GHz) : +15.5dBm minimum802.11n HT40(2.4GHz) : +14.5dBm minimum802.11n HT20(5GHz) : +15.5dBm minimum802.11n HT40(5GHz) : +14.5dBm minimum802.11ac VHT80(5GHz) : +11.5dBm minimum
	Power Consumption	<ul style="list-style-type: none">Transmit mode: 2.0 W

Technical Specifications

	<ul style="list-style-type: none">• Receive mode:1.6 W• Idle mode (PSP) 180 mW (WLAN Associated)• Idle mode: 50 mW (WLAN unassociated)• Connected Standby/Modern Standby: 10mW• Radio disabled: 8 mW	
Power Management	ACPI and PCI Express compliant power management 802.11 compliant power saving mode	
Receiver Sensitivity ⁴	<ul style="list-style-type: none">• 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	1. Type 2230 : 2.3 x 22.0 x 30.0 mm 2. Type 1216: 1.67 x 12.0 x 16.0 mm	
Weight	1. Type 2230 : 2.8g 2. Type 126: 1.3g	
Operating Voltage	3.3v +/- 9%	
Temperature	Operating	14° to 158° F (-10° to 70° C)
	Non-operating	-40° to 176° F (-40° to 80° C)
Humidity	Operating	10% to 90% (non-condensing)
	Non-operating	5% to 95% (non-condensing)
Altitude	Operating	0 to 10,000 ft (3,048 m)
	Non-operating	0 to 50,000 ft (15,240 m)
LED Activity	LED Amber - Radio OFF LED Off - Radio ON	

1.Wireless access point and internet service required and sold separately. Availability of public wireless access points limited. Wi-Fi 5 (802.11 ac) is backwards compatible with prior 802.11 specs.

2. Check latest software/driver release for updates on supported security features.

3.The FCC has declared as of September 1, 2014 products that utilize passive scanning on channel 12/13 and are capable of transmitting must fully comply with requirements of 15.247 or otherwise disable those channels.

4. Receiver sensitivity is measured at a packet error rate of 8% for 802.11b (CKK modulation) and a packet error rate of 10% for 802.11a/g (OFDM modulation).

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

Bluetooth Specification	4.0/4.1/4.2/5.0 Compliant
Frequency Band	2402 to 2480 MHz
Number of Available Channels	Legacy : 0~79 (1 MHz/CH) BLE : 0~39 (2 MHz/CH)

Technical Specifications

	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.
<hr/>		
Realtek 802.11a/b/g/n/ac (1x1) Wi-Fi® and Bluetooth® 4.2 Combo ¹	Wireless LAN Standards	IEEE 802.11a IEEE 802.11b IEEE 802.11g IEEE 802.11n IEEE 802.11ac IEEE 802.11d IEEE 802.11e IEEE 802.11h IEEE 802.11i IEEE 802.11k IEEE 802.11r IEEE 802.11v
	Interoperability	Wi-Fi certified modules
	Frequency Band	802.11b/g/n <ul style="list-style-type: none">• 2.402 - 2.482 GHz 802.11a/n/ac <ul style="list-style-type: none">• 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	<ul style="list-style-type: none">• 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
	Security²	<ul style="list-style-type: none">• 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)

Technical Specifications

Roaming	IEEE 802.11 compliant roaming between access points	
Output Power ³	<ul style="list-style-type: none">• 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	<ul style="list-style-type: none">• Transmit mode: 2.0 W• Receive mode:1.6 W• Idle mode (PSP) 180 mW (WLAN Associated)• Idle mode: 50 mW (WLAN unassociated)• Connected Standby/Modern Standby: 10mW• Radio disabled: 8 mW	
Power Management	ACPI and PCI Express compliant power management 802.11 compliant power saving mode	
Receiver Sensitivity ⁴	<ul style="list-style-type: none">• 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 Off - Radio ON	

1. Wi-Fi supporting gigabit speeds (802.11ac) is achievable when transferring files between two devices connected to the same route Requires a wireless router, sold separately, that supports 160MHz channels.

2. Check latest software/driver release for updates on supported security features.

3.The FCC has declared as of September 1, 2014 products that utilize passive scanning on channel 12/13 and are capable of transmitting must fully comply with requirements of 15.247 or otherwise disable those channels.

4. Receiver sensitivity is measured at a packet error rate of 8% for 802.11b (CKK modulation) and a packet error rate of 10% for 802.11a/g (OFDM modulation).

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.

Realtek
802.11a/b/g/n/ac (2x2)
Wi-Fi® and Bluetooth®
4.2 Combo¹

Wireless LAN Standards	IEEE 802.11a IEEE 802.11b IEEE 802.11g IEEE 802.11n IEEE 802.11ac IEEE 802.11d IEEE 802.11e IEEE 802.11h IEEE 802.11i IEEE 802.11k IEEE 802.11r IEEE 802.11v
Interoperability	Wi-Fi certified modules
Frequency Band	802.11b/g/n <ul style="list-style-type: none">2.402 - 2.482 GHz 802.11a/n/ac <ul style="list-style-type: none">4.9 - 4.95 GHz (Japan)5.15 - 5.25 GHz5.25 - 5.35 GHz5.47 - 5.725 GHz5.825 - 5.850 GHz
Data Rates	<ul style="list-style-type: none">802.11b: 1, 2, 5.5, 11 Mbps802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps802.11n: 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 ²	<ul style="list-style-type: none">IEEE and WiFi compliant 64 / 128 bit WEP encryption for a/b/g mode onlyAES-CCMP: 128 bit in hardware802.1x authenticationWPA, WPA2: 802.1x. WPA-PSK, WPA2-PSK, TKIP, and AES.WPA2 certificationIEEE 802.11i

Technical Specifications

	<ul style="list-style-type: none">• WAPI	
Network Architecture Models	Ad-hoc (Peer to Peer)	
	Infrastructure (Access Point Required)	
Roaming	IEEE 802.11 compliant roaming between access points	
Output Power³	<ul style="list-style-type: none">• 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	
	<ul style="list-style-type: none">• Transmit mode: 2.0 W• Receive mode:1.6 W• Idle mode (PSP) 180 mW (WLAN Associated)• Idle mode: 50 mW (WLAN unassociated)• Connected Standby/Modern Standby: 10mW• Radio disabled: 8 mW	
Power Consumption	<ul style="list-style-type: none">• Transmit mode: 2.0 W• Receive mode:1.6 W• Idle mode (PSP) 180 mW (WLAN Associated)• Idle mode: 50 mW (WLAN unassociated)• Connected Standby/Modern Standby: 10mW• Radio disabled: 8 mW	
Power Management	ACPI and PCI Express compliant power management 802.11 compliant power saving mode	
Receiver Sensitivity⁴	<ul style="list-style-type: none">• 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	
	<ul style="list-style-type: none">• 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 Off - Radio ON	

1. Wi-Fi supporting gigabit speeds (802.11ac) is achievable when transferring files between two devices connected to the same route Requires a wireless router, sold separately, that supports 160MHz channels.

2. Check latest software/driver release for updates on supported security features.

3.The FCC has declared as of September 1, 2014 products that utilize passive scanning on channel 12/13 and are capable of transmitting must fully comply with requirements of 15.247 or otherwise disable those channels.

4. Receiver sensitivity is measured at a packet error rate of 8% for 802.11b (CKK modulation) and a packet error rate of 10% for 802.11a/g (OFDM modulation).

Technical Specifications

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

AC Adapter 65 Watt Smart nPFC EM Barrel 4.5mm New EM	Dimensions (H x W x D)	102x55x30mm
	Weight	unit: 250g +/- 10g
	Input	Input Efficiency88.0 % at 115 Vac and 89.0 % at 230Vac
		Input frequency range47 ~ 63 Hz
		Input AC currentMax. 1.7 A at 90 Vac
	Output	Output power65W
		DC output19.5V
		Hold-up time5ms at 115 Vac input
		Output current limit<11.0A
	Connector	C6 (3pin/with grounded, with Smart ID DC connector)
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.	

Technical Specifications

AC Adapter 45 Watt Smart nPFC Standard Barrel 4.5mm Right Angle 1.8m	Dimensions	95 x 40 x 26.5 mm
	Weight	200 g +/- 10 g
	Input	Input Efficiency87.74 % at 115 Vac and 88.4 % at 230Vac
		Input frequency range47 ~ 63 Hz
	Output	Input AC currentMax. 1.4 A at 90 Vac
		Output power45 W
		DC output19.5 V
		Hold-up time5 ms at 115 Vac input
		Output current limit<8.0A
	Connector	C6 (3pin/with grounded, with Smart ID DC connector)
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.	

Country of Origin

China

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

Type	Description	Part Number
Cases	HP Prelude Pro Top Load	1X645AA
	HP Prelude Pro Backpack	1X644AA
	HP Prelude Top Load 15.6	1E7D7AA
	HP Prelude Backpack 15.6	1E7D6AA
Docking	HP USB-C®/A Universal Dock G2	5TW13AA
	HP 4.5 mm and USB-C® Dock Adapter G2	6LX61AA
Input/Output	HP USB Essential Keyboard/Mouse	H6L29AA
	HP Wired Desktop 320MK Mouse and Keyboard	9SR36AA
	HP Slim Wireless Keyboard & Mouse	T6L04AA
	HP Wired Desktop 320K Keyboard	9SR37AA
	HP Slim Wireless Keyboard (Link-5)	T6U20AA
	HP 3-Button USB Laser Mouse	H4B81AA
	HP Essential USB Mouse	2TX37AA
	HP USB Travel Mouse	G1K28AA
	HP Bluetooth Travel Mouse	6SP30AA
	HP Comfort Grip Wireless Mouse	H2L63AA
	HP Wired Desktop 320M Mouse	9VA80AA
	HP HDMI to VGA Adapter	H4F02AA
	HP HDMI to DVI	F5A28AA
Power	HP 45W Smart AC Adapter	H6Y88AA
	HP 65W Smart AC Adapter	H6Y89AA
	HP 65W Slim Adapters (w/ detachable DC cable + TIPS)	H6Y82AA
Storage	HP External USB Optical Drive	F2B56AA

Summary of Changes

Date of change:	Version History:		Description of change:
	V1 to V2		

Copyright © 2020 HP Development Company, L.P. The only warranties for HP products are set forth in the express limited warranty statements accompanying such products. Nothing herein should be construed as constituting an additional warranty. HP shall not be liable for technical or editorial errors or omissions contained herein.

AMD and Radeon are trademarks of Advanced Micro Devices, Inc. Bluetooth is a trademark owned by its proprietor and used by HP Inc. under license. USB Type-C® and USB-C® are registered trademarks of USB Implementers Forum. ENERGY STAR is a registered trademark of the U.S. Environmental Protection Agency. All other trademarks are the property of their respective owners.