

Overview

HP ProBook x360 11 G5 EE



- 1. Webcam LED
- 2. 720p Webcam or optional HP Privacy Camera
- 3. Microphone
- 4. ClickPad
- 5. World-facing 5 Megapixels Webcam (Optional)

Left

- 6. World-facing Webcam LED (Optional)
- 7. Power Button
- 8. Headphone / Microphone Combo Jack
- 9. USB 3.1 Gen 1 Port
- 10. Security Lock Slot (Nano lock sold separately)



Overview



- 1. Power Connector
- 2. Ethernet (RJ-45) Port
- 3. HDMI Port (Cable not included)

Right

- 4. USB 3.1 Gen 1 Port
- 5. USB Type-C™ (Data and Power in-out)

Overview

AT A GLANCE

- Starting at 3.16 lbs (1.44 kg) touch
- At 21 mm (0.83"), this flexible 360° hinge converts to laptop, tablet, tent, stand or book mode easily
- Designed to pass MIL-STD 810G testing¹ with rugged features such as co-molded rubber trim, spill- and pick-resistant keyboard, and Corning® Gorilla® Glass 3 touch screen
- Optional dual camera system for project-based learning
- New optional active HP Pro Pen is engineered for the classroom – durable tips require less replacing
- Pre-installed with Windows 10 Pro 64, Windows 10 Pro 64 (National Academic), Windows 10 Home 64, or Windows 10 Pro in S mode 64, FreeDOS²
- Powered by Intel® Celeron® N4000, Intel® Celeron® N4100 and Intel® Pentium® N4020, N4120 and Pentium N5000, N5030 processors
- Choice of 29.4cm (11.6") diagonal HD UWVA slim LED touch screen (1366 x 768) or 29.4 cm (11.6") diagonal HD SVA slim LED touch screen (1366 x 768) displays
- 64 GB eMMC, 128 GB SATA-3 TLC Solid State Drive or up to 256 GB SATA-3 Solid State Drive storage options
- Up to 8 GB system memory for enhanced memory management
- Reliable connectivity with choice of Intel® Dual Band Wireless-AC 9560 802.11a/b/g/n/ac (2x2) WiFi and Bluetooth® 5.0 Combo WLAN or Intel® Dual Band Wireless-AX200 802.11a/b/g/n/ax (2x2) Wi-Fi 6 and Bluetooth® 5.0 Combo WLAN for learning and collaboration beyond the classroom
- Built-in ports include: Ethernet (RJ-45), 2 USB 3.1 Gen 1, USB Type-C™, and HDMI 2.0a port for connecting to high-resolution displays
- Enhanced security TPM 2.0 discrete chip
- Battery life Up to 16 hours and 45 minutes³

1. MIL STD 810G testing is pending and is not intended to demonstrate fitness for U.S. Department of Defense contract requirements or for military use. Test results are not a guarantee of future performance under these test conditions. Damage under the MIL STD test conditions or any accidental damage requires an optional HP Accidental Damage Protection Care Pack.

2. FreeDOS planned to be available March 2020.

3. Recharges the battery up to 90% within 90 minutes when the system is off or in standby mode. Power adapter with a minimum capacity of 65 watts is required. After charging has reached 50% capacity, charging will return to normal. Charging time may vary +/-10% due to System tolerance.

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



Technical Specifications

PRODUCT NAME

HP ProBook x360 11 G5 EE

OPERATING SYSTEM

Preinstalled

Windows 10 Pro 64¹
Windows 10 Pro 64 (National Academic only)²
Windows® 10 Home 64¹
Windows 10 Home Single Language 64¹
Windows 10 Pro in S mode 64³
Windows 10 Pro in S mode 64 (National Academic only)^{2,3}
Windows 10 Pro (Windows 10 Enterprise available with a Volume Licensing Agreement)¹

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.
3. Windows 10 Pro in S mode 64 works exclusively with apps from the Windows store. Some accessories and apps compatible with Windows 10 may not work, and performance may vary. Certain default settings, features, and apps cannot be changed. Easily switch to Windows 10 Pro configuration (fee applies) Learn more at Microsoft.com/Windows10S.

PROCESSORS

Intel® Pentium® Silver N5000 with Intel® UHD Graphics 605 (1.1 GHz base frequency, up to 2.7 GHz burst frequency, 4 MB cache, 4 cores)^{4,5,6}

Intel® Celeron® N4100 with Intel® UHD Graphics 600 (1.1 GHz base frequency, up to 2.4 GHz burst frequency, 4 MB cache, 4 cores)^{4,5,6}

Intel® Celeron® N4000 with Intel® UHD Graphics 600 (1.1 GHz base frequency, up to 2.6 GHz burst frequency, 4 MB cache, 2 cores)^{4,5,6}

Intel® Pentium® Silver N5030 with Intel® UHD Graphics 605 (1.1 GHz base frequency, up to 3.1 GHz burst frequency, 4 MB cache, 4 cores)^{4,5,6}

Intel® Celeron® N4020 with Intel® UHD Graphics 600 (1.1 GHz base frequency, up to 2.8 GHz burst frequency, 4 MB cache, 2 cores)^{4,5,6}

Intel® Celeron® N4120 with Intel® UHD Graphics 600 (1.1 GHz base frequency, up to 2.6 GHz burst frequency, 4 MB cache, 4 cores)^{4,5,6}

Processors Family

Intel® Celeron® processor (N4000, N4020, 4120)⁶

Intel® Pentium® Silver processor (N5000, N5030)⁶

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. Intel's numbering, branding and/or naming is not a measurement of higher performance.

5. Processor speed denotes maximum performance mode; processors will run at lower speeds in battery optimization mode.

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>.



Technical Specifications

CHIPSET

Chipset is integrated with processor

GRAPHICS

Integrated

Intel® UHD Graphics 605 (for Pentium Silver)⁷

Intel® UHD Graphics 600 (for Celeron)⁷

7. HD content required to view HD images

DISPLAY

Internal

Touch

29.46 cm (11.6") diagonal HD SVA eDP WLED-backlit touch screen with HD camera, 220 nits, 45% NTSC (1366 x 768)^{7,8,9}

29.46 cm (11.6") diagonal HD IPS eDP WLED-backlit touch screen with HD camera, 220 nits, 50% NTSC (1366 x 768)^{7,8,9}

HDMI

Port supports resolutions up to 3840 x 2160 external resolution @30 Hz

7. HD content required to view HD images.

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

9. Sold separately or as an optional feature.

STORAGE AND DRIVES

Primary Storage M.2

128 GB SATA-3 TLC Solid State Drive^{10,11}

256 GB SATA-3 TLC Solid State Drive^{10,11}

eMMC Configurations

64 GB eMMC¹⁰

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.

11. Not available with eMMC storage.



Technical Specifications

MEMORY

Standard**Maximum Memory**

8 GB DDR4-2400 SDRAM¹²

Memory

4 GB DDR4-2400 SDRAM (on-board)¹²

8 GB DDR4-2400 SDRAM (on-board)¹²

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

NETWORKING/COMMUNICATIONS

WLAN

Intel® Dual Band Wireless-AC 9560 802.11a/b/g/n/ac (2x2) Wi-Fi® and Bluetooth® 5 Combo, non-vPro™¹³

Intel® Dual Band Wireless-AX200 802.11a/b/g/n/ax (2x2) Wi-Fi 6 and Bluetooth® 5 Combo, non-vPro™ *

Miracast

Native Miracast Support¹⁴

Ethernet

Realtek RTL8111HSH-CG 10/100/1000 GbE NIC¹⁵

13. 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.

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

15. 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.

*Wireless access point and internet service required and sold separately. Availability of public wireless access points limited. Wi-Fi 6 is backwards compatible with prior 802.11 specs. The specifications for Wi-Fi 6 (802.11ax) are draft and are not final. If the final specifications differ from the draft specifications, it may affect the ability of the notebook to communicate with other 802.11ax devices.



Technical Specifications

AUDIO/MULTIMEDIA

Audio

HP HD Audio

2 Integrated stereo speakers

Camera

User-facing 720p HD camera^{7,16}

Located on display

Webcam

World-facing 5 MP secondary camera (Optional)^{7,9,16}

7. HD content required to view HD images.

9. Sold separately or as an optional feature.

16. Internet access required.

KEYBOARDS/POINTING DEVICES/BUTTONS & FUNCTION KEYS/PEN

Keyboard

Full-sized chiclet keyboard, pick proof

Pointing Device

Clickpad with multi-touch gesture support, taps enabled as default

Default on: 2-finger scroll, pinch

Support Windows 10 modern Trackpad gestures

Function Keys

F1 - Blank

F2 - Blank

F3 - Sleep

F4 - Display Switching

F5 - Audio Mute/Unmute

F6 - Volume <down>

F7 - Volume <up>

F8 - Mic Mute/Unmute

F9 - Brightness <down>

F10 - Brightness <up>

F11 - Blank

F12 - Wireless On/Off

Pen

Optional Passive Targus Slim Stylus*

Optional Active HP Pro Pen

Sensors

Combo Chip

Accelerometer



Technical Specifications

Magnetometer
Gyroscope
Hall Sensor

*Optional Passive Targus Slim Stylus

SOFTWARE AND SECURITY

BIOS

HP BIOSphere Gen5¹⁷
HP Drive Lock & Automatic Drive Lock¹⁸
BIOS Update via Network
Master Boot Record Security
Power On Authentication
Secure Erase¹⁹
Absolute Persistence Module²⁰
Pre-boot Authentication

Software

HP Connection Optimizer
HP School Pack
HP Interactive Light
HP Image Assistant
HP Hotkey Support
HP JumpStart
HP Support Assistant²¹
HP Noise Cancellation Software
Buy Office (sold separately)

Manageability Features

HP Driver Packs²²
HP System Software Manager (SSM)
HP BIOS Config Utility (BCU)
HP Client Catalog
HP Manageability Integration Kit Gen3²³

Client Security Software

HP Client Security Manager Gen5²⁴
Windows Defender²⁵

Security Management

Pre-boot Authentication
TPM 2.0 Embedded Security Chip shipped with Windows 10 (Common Criteria EAL4+ Certified)²⁶
USB enable/disable (via BIOS)
Power-on password (via BIOS)
Setup password (via BIOS)
Support for chassis padlocks and cable lock devices
HP Sure Click²⁷

17. HP BIOSphere Gen5 is available on select HP Pro and Elite PCs. See product specifications for details. Features may vary depending on the platform and configurations.

18. HP Drive Lock & Automatic Drive Lock is not supported on NVMe drives

19. For the methods outlined in the National Institute of Standards and Technology Special Publication 800-88 "Clear" sanitation method. HP Secure Erase does not support platforms with Intel® Optane™.



Technical Specifications

- 20. Absolute firmware module is shipped turned off and can only be activated with the purchase a license subscription and full activation of the software agent. License subscriptions can be purchased for terms ranging multiple years. Service is limited, check with Absolute for availability outside the U.S. Certain conditions apply. For full details visit: <https://www.absolute.com/about/legal/agreements/absolute/>.
- 21. HP Support Assistant requires Windows and Internet access.
- 22. HP Driver Packs not preinstalled, however available for download at <http://www.hp.com/go/clientmanagement>.
- 23. HP Manageability Integration Kit can be downloaded from <http://www.hp.com/go/clientmanagement>.
- 24. HP Client Security Manager Gen5 requires Windows and is available on the select HP Pro and Elite PCs. See product specifications for details.
- 25. Windows Defender Opt in and internet connection required for updates.
- 26. 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).
- 27. HP Sure Click is available on select HP platforms and supports Microsoft® Internet Explorer, Google Chrome, and Chromium™. Supported attachments include Microsoft Office (Word, Excel, PowerPoint) and PDF files in read only mode. Check <http://h20195.www2.hp.com/v2/GetDocument.aspx?docname=4AA7-0922ENW> for all compatible platforms as they become available.

POWER

Power Supply

- HP Smart 45 W External AC power adapter²⁸
- HP Smart 65 W EM External AC power adapter²⁸
- HP Smart 45 W USB Type-C™ adapter²⁸

Primary Battery

- HP Long Life 3-cell, 48 Wh Li-ion (90% in 90 minutes)^{29,30}

Power Cord

- 3-wire plug - 1m

Battery life

- Up to 16 hours and 45 minutes³¹

- 28. Availability may vary by country.
- 29. Battery is internal and not replaceable by customer. Serviceable by warranty.
- 30. 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.
- 31. Recharges the battery up to 90% within 90 minutes when the system is off or in standby mode. Power adapter with a minimum capacity of 65 watts is required. After charging has reached 50% capacity, charging will return to normal. Charging time may vary +/-10% due to System tolerance.



Technical Specifications

WEIGHTS & DIMENSIONS

Product Weight

Starting at 3.16 lb³²

Starting at 1.44 kg³²

Product Dimensions (w x d x h)

11.8 x 8.8 x 0.83 in

30 x 20.53 x 2.12 cm

32. Weight will vary by configuration.

PORTS/SLOTS

Ports

2 USB 3.1 Gen 1

1 USB Type-C™ (Data transfer, power delivery)

1 HDMI 2.0a³³

1 AC power

1 RJ-45

1 headphone/microphone combo jack

33. HDMI cable sold separately.

SERVICE AND SUPPORT

HP Services offers 1-year limited warranties and 90 day software limited warranty options depending on country. Batteries have a default one year limited warranty refer to <http://www.hp.com/support/batterywarranty/> for additional battery information. On-site service and extended coverage is also available. HP Care Pack Services are optional extended service contracts that go beyond the standard limited warranties. To choose the right level of service for your HP product, use the HP Care Pack Services Lookup Tool at: <http://www.hp.com/go/cpc>.³⁴

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



Technical Specifications

SYSTEM UNIT

Stand-Alone Power Requirements (AC Power)

Nominal Operating Voltage	19V
Average Operating Power	Win 10
Integrated graphics	Yes
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	240 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®	Yes ³⁶
EPEAT® 2019	Yes, Silver in U.S. ³⁷
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



Technical Specifications

36. Configurations of the HP ProBook x360 11 G5 EE is ENERGY STAR® qualified are identified as HP ProBook x360 11 G5 EE ENERGY STAR on HP websites and on <http://www.energystar.gov>.

37. 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 11.6 HD AG WLED SVA 45% NTSC 220 nits eDP Slim	Outline Dimensions (W x H x D)	278.5 x 168.5 mm (max)
	Active Area	256.125 x 144 mm
	Weight	210 g max
	Diagonal Size	11.6 (inches)
	Thickness	3.0 mm (max)
	Interface	eDP1.2
	Surface Treatment	BrightView Glass
	Touch Enabled	Yes
	Contrast Ratio	400:1 (typical)
	Refresh Rate	60 Hz
	Brightness	220 nit 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
Viewing Angle	SVA 45/45/15/35	
Panel LCD 11.6 inch HD AG WLED UWVA 50% NTSC 220 nits eDP slim	Outline Dimensions (W x H x D)	278.5 x 168.5 mm (max)
	Active Area	256.125 x 144 mm
	Weight	200 g max
	Diagonal Size	11.6 (inches)
	Thickness	3.2 mm max
	Interface	eDP1.2
	Surface Treatment	BrightView Glass
	Touch Enabled	Yes



Technical Specifications

Contrast Ratio	800:1 (typical)
Refresh Rate	60 Hz
Brightness	220 nit typical (panel only)
Pixel Resolution	1366 x 768 (HD)
Format of LCD Pixel Arrangement	RGB
Backlight	LED
Color Gamut Coverage	50% of NTSC
Color Depth	6 bits
Viewing Angle	UWVA 85/85/85/85

STORAGE AND DRIVES

eMMC 64 GB M0-276 MMCv5.0	Drive Weight	0.2	
	Height	1.4 mm	
	Width	11.5 x 13 mm	
	Interface	MMC potocal	
	Seek Time	Sequential Read	Sequential Write
		Up to 250 MB/s	Up to 70 MB/s
	Logical Blocks	32 GB(31,268,536,320 Bytes)/64 GB(62,537,072,640 Bytes)	
	Operating Temperature	0 to 70	
Security Features	HS400		

128 GB 2280 M2 SATA-3 TLC Solid State Drive	Form Factor	M.2 2280	
	Capacity	128 GB	
	NAND Type	TLC	
	Height	0.09 in (2.3 mm)	
	Width	0.87 in (22 mm)	
	Weight	0.02 lb (10 g)	
	Interface	ATA-8, SATA 3.0	
	Seek Time	Sequential Read	Sequential Write
		Up To 520 MB/s	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 M2 SATA-3 TLC Solid State Drive	Form Factor	M.2 2280
	Capacity	256 GB



Technical Specifications

NAND Type	TLC	
Height	0.09 in (2.3 mm)	
Width	0.87 in (22 mm)	
Interface	ATA-8, SATA 3.0	
Seek Time	Sequential Read	Sequential Write
	Up To 540 MB/s	Up To 515 MB/s
Logical Blocks	500,118,192	
Operating Temperature	32° to 158°F (0° to 70°C) [ambient temp]	
Features	DIPM; TRIM; DEVSLP	

NETWORKING/COMMUNICATIONS

Intel® 9560 802.11a/b/g/n/ac (2x2) WiFi and Bluetooth® 5.0 Combo¹ non-vPro	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 Frequency Band	Wi-Fi® certified •802.11b/g/n 2.402 – 2.482 GHz •802.11a/n/ac 4.9 – 4.95 GHz (Japan) 5.15 – 5.25 GHz 5.25 – 5.35 GHz 5.47 – 5.725 GHz 5.825 – 5.850 GHz
	Data Rates	•802.11b: 1, 2, 5.5, 11 Mbps •802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps •802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps •802.11n: MCS 0 ~ MCS 15, (20MHz, and 40MHz) •802.11ac: MCS0 ~ MCS9, (1SS, and 2SS) (20MHz, 40MHz, 80MHz & 160MHz)
	Modulation	Direct Sequence Spread Spectrum BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM
	Security³	•IEEE and WiFi compliant 64 / 128 bit WEP encryption for a/b/g mode only •AES-CCMP: 128 bit in hardware •802.1x authentication



Technical Specifications

	<ul style="list-style-type: none"> •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 Power²	<ul style="list-style-type: none"> • 802.11b : +18.5dBm minimum • 802.11g : +17.5dBm minimum • 802.11a : +18.5dBm minimum • 802.11n HT20(2.4GHz) : +15.5dBm minimum • 802.11n HT40(2.4GHz) : +14.5dBm minimum • 802.11n HT20(5GHz) : +15.5dBm minimum • 802.11n HT40(5GHz) : +14.5dBm minimum • 802.11ac VHT80(5GHz) : +11.5dBm minimum • 802.11ac VHT160(5GHz) : +11.5dBm minimum
Power Consumption	<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 10mW •Radio disabled 8 mW
Power Management	ACPI and PCI Express compliant power management 802.11 compliant power saving mode
Receiver Sensitivity³	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
Form Factor Dimensions	Two embedded dual band 2.4/5 GHz antennas are provided to the card to support WLAN MIMO communications and Bluetooth communications PCI-Express M.2 MiniCard with CNVi Interface
Weight	1. Type 2230 : 2.3 x 22.0 x 30.0 mm 2. Type 1216: 1.67 x 12.0 x 16.0 mm
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)



Technical Specifications

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 4.0/4.1/4.2/5.0 Wireless Technology

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



Technical Specifications

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® Wi-Fi 6 AX200 + Bluetooth 5 (802.11ax 2x2, non-vPro, supporting gigabit file transfer speeds) non-vPro

Wireless LAN Standards

IEEE 802.11a
 IEEE 802.11b
 IEEE 802.11g
 IEEE 802.11n
 IEEE 802.11ac
 IEEE 802.11ax
 IEEE 802.11d
 IEEE 802.11e
 IEEE 802.11h
 IEEE 802.11i
 IEEE 802.11k
 IEEE 802.11r
 IEEE 802.11v

Interoperability Frequency Band

Wi-Fi® certified
 •802.11b/g/n/ax
 2.402 – 2.482 GHz
 •802.11a/n/ac/ax
 4.9 – 4.95 GHz (Japan)
 5.15 – 5.25 GHz
 5.25 – 5.35 GHz
 5.47 – 5.725 GHz
 5.825 – 5.850 GHz

Data Rates

•802.11b: 1, 2, 5.5, 11 Mbps
 •802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps
 •802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps
 •802.11n: MCS 0 ~ MCS 15, (20MHz, and 40MHz)
 •802.11ac : MCS0 ~ MCS9, (1SS, and 2SS) (20MHz, 40MHz, 80MHz & 160MHz)
 • 802.11ax : MCS0 ~ MCS11, (1SS and 2SS) (20MHz, 40MHz, 80MHz & 160MHz)

Modulation

Direct Sequence Spread Spectrum
 OFDM, BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM, 1024QAM

Security³

•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



Technical Specifications

Network Architecture	Ad-hoc (Peer to Peer)
Models	Infrastructure (Access Point Required)
Roaming	IEEE 802.11 compliant roaming between access points
Output Power²	<ul style="list-style-type: none"> • 802.11b : +18.5dBm minimum • 802.11g : +17.5dBm minimum • 802.11a : +18.5dBm minimum • 802.11n HT20(2.4GHz) : +15.5dBm minimum • 802.11n HT40(2.4GHz) : +14.5dBm minimum • 802.11n HT20(5GHz) : +15.5dBm minimum • 802.11n HT40(5GHz) : +14.5dBm minimum • 802.11ac VHT80(5GHz) : +11.5dBm minimum • 802.11ac VHT160(5GHz) : +11.5dBm minimum • 802.11ax HT40(2.4GHz) : +10dBm minimum • 802.11ax VHT160(5GHz) : +10dBm minimum
Power Consumption	<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
Receiver Sensitivity³	802.11 compliant power saving mode <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 • 802.11ax, MCS11(HT40): -59dBm maximum • 802.11ax, MCS11(VHT160): -58.5dBm maximum
Antenna type	High efficiency antenna with spatial diversity, mounted in the display enclosure
	Two embedded dual band 2.4/5 GHz antennas are provided to the card to support WLAN MIMO communications and Bluetooth communications
Form Factor	PCI-Express M.2 MiniCard
Dimensions	1. Type 2230 : 2.3 x 22.0 x 30.0 mm 2. Type 1216: 1.67 x 12.0 x 16.0 mm
Weight	1. Type 2230: 2.8 g 2. Type 126: 1.3 g
Operating Voltage	3.3v +/- 9%
Temperature	Operating 14° to 158° F (–10° to 70° C) Non-operating –40° to 176° F (–40° to 80° C)
Humidity	Operating 10% to 90% (non-condensing) Non-operating 5% to 95% (non-condensing)



Technical Specifications

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. 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 4.0/4.1/4.2/5.0/5.1 Wireless Technology

Bluetooth Specification	4.0/4.1/4.2/5.0/5.1 Compliant
Frequency Band	2402 to 2480 MHz
Number of Available Channels	Legacy: 0~79 (1 MHz/CH) BLE: 0~39 (2 MHz/CH)
Signaling Data Rate	Legacy: 3 Mbps signaling data rate ¹ 2.17 Mbps BLE: 1 Mbps signaling data rate ¹ 0.2 Mbps 1. Actual throughput may vary.
Transmit Power	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) The Bluetooth component shall operate as a Class II Bluetooth device with a maximum transmit power of + 9.5 dBm for BR and EDR.
Power Consumption	Peak (Tx) 330 mW Peak (Rx) 230 mW Selective Suspend 17 mW
Bluetooth Software Supported	Microsoft Windows Bluetooth Software
Link Topology	
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



Technical Specifications

FAX Profile (FAX)
 Basic Imaging Profile (BIP)2
 Headset Profile (HSP)
 Hands Free Profile (HFP)
 Advanced Audio Distribution Profile (A2DP)

POWER

HP 45 W 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 (175 g) max Not including power cord. Power cord varies by country
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 45 W DC output 19.5 V Hold-up time 5ms at 115 VAC input Output current protection <8.0A
Connector	4.5mm Barrel Type, 3 pin/grounded, mates with interchangeable cords
Environmental Design	Operating temperature 32° to 95° F (0° to 35° C) Non-operating (storage) temperature -4° 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 65 W EM Smart AC adapter

Dimensions	102 x 55 x 30 mm
Weight	270 g +/- 10 g Not including power cord. Power cord varies by country
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



Technical Specifications

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%
EMI and 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 45 W USB type C Straight 1.8 m AC Adapter	Dimensions	94.0mm x 40.0mm x 26.5 mm		
	Weight	192.5 g +/-10% Not including power cord. Power cord varies by country		
	Input	Input Efficiency	Average Efficiency of 25%, 50%, 75%, 100% load condition with 115Vac/230Vac Spec: 5V: 81.5% 9V: 86.7% 12V: 87.41% 15V: 87.8%	
		Input frequency range	47 ~ 63Hz	
		Input AC current	Max. 1.4 A at 90 Vac	
		Output	Output power	5V/15W 9V/27W 12V/36W 15V/45W
			DC output	5V/9V/12V/15V
	Hold-up time		5ms at 115 Vac input	
	Connector	Output current limit	<5.0A	
		USB 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			



Technical Specifications

Worldwide safety standards - IEC60950, EN60950, UL60950, Class1, SELV;
Agency approvals - C-UL-US, NORDICS, DENAN, EN55022 Class B, FCC Class B, CISPR22 Class B, CCC, NOM-1 NYCE.

MTBF - over 200,000 hours at 25°C ambient condition.

HP 3-cell Long Life Li-Ion (48 WHr)	Dimensions (H x W x L)	7.3 x 94 x 184.47 mm (0.287 x 3.7 x 7.263 inch)
	Weight	0.215 kg
	Cells/Type	3cell Lithium-Ion Prismatic cell / 596080 3cell Lithium-Ion Polymer cell / 606072
	Voltage	11.4 V
	Amp-hour capacity	4.212Ah
	Watt-hour capacity	48Wh
	Operating (Charging)	32° to 113° F (0° to 45° C)
	Operating (Discharging)	14° to 122° F (-10° to 60° C)
	Optional Travel Battery Available	No



Technical Specifications

COUNTRY OF ORIGIN

China



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

Type	Description	Part Number
Cases	HP Essential Top Load Case (up to 15.6")	H2W17AA
	HP Essential Backpack (up to 15.6")	H1D24AA
	HP Slim Ultrabook Top Load (up to 15.6" x .88"/22/5mm)	F3W15AA
	HP Slim Ultrabook Backpack (up to 15.6" x .88"/22/5mm)	F3W16AA
	HP Black 11.6 Always On Case	2MY57AA
	HP Slim Ultrabook Messenger	F3W14AA
Docking*	HP USB Travel Dock	T0K30AA
	HP 3005pr USB3 Port Replicator	Y4H06AA
	HP USB-C/A Universal Dock G2	5TW13AA
Input/Output	HP Comfort Grip Wireless Mouse	H2L63AA
	HP Slim USB Keyboard & Mouse Bundle	T6T83AA
	HP 3-Button Laser Mouse	H4B81AA
	HP USB Premium Mouse	1JR32AA
	HP Wireless Premium Mouse	1JR31AA
	HP Essential USB Mouse	2TX37AA
	HP USB Travel Mouse	G1K28AA
	HP Slim Bluetooth Mouse	F3J92AA
	HP Slim Wireless keyboard and mouse	T6L04AA
	HP USB-C to USB 3.0 Adapter	N2Z63AA
	HP USB-C to 3 and 4.5mm Adapter	N2Z65AA
	HP USB-C to VGA Adapter	N9K76AA
	HP USB-C to HDMI 2.0	1WC36AA
	HP HDMI to VGA Adapter	H4F02AA
	HP Pro Pen with Spare Tips	TBD
HP Pro Pen Nib Set	TBD	
Power	HP 45W Smart AC Adapter (4.5mm)	H6Y88AA
	HP 65W Smart AC Adapter (4.5mm)	H6Y89AA
	HP 45W LC USB-C Power Adapter	1MZ01AA
	HP Notebook Powerbank	N9F71AA
	HP USB-C ESSENTIAL POWER BANK	3TB55AA
	HP USB-C Notebook Power Bank	2NA10AA
Storage	HP External USB Optical Drive	F2B56AA
Security	HP Nano Keyed Cable Lock	1AJ39AA
UCC	HP Stereo USB Headset	T1A67AA
	HP Stereo 3.5mm Headset	T1A66AA

*Supported using the USB connection for video and data. Power is not supported and must be provided directly to the Notebook with the power adapter that comes with the unit



Summary of Changes

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

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